THE ARCHITECTURAL FORUM

MARCH
1922

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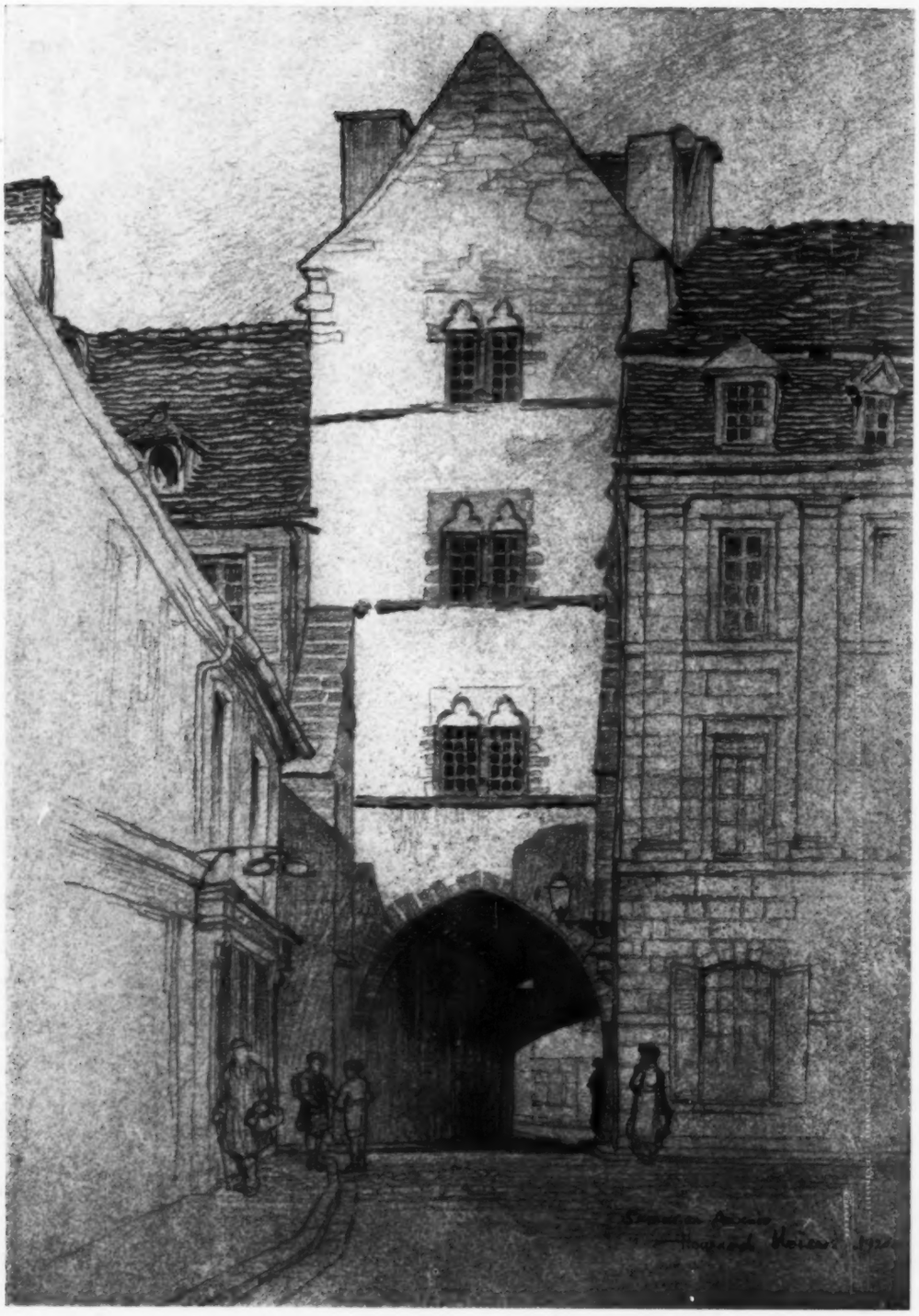


OLD GATE TOWER, SEMUR-EN-AUXOIS, BURGUNDY
FROM THE PENCIL DRAWING BY HOWARD MOÏSE

The
ARCHITECTURAL
FORUM

VOLUME XXXVI MARCH 1922 NUMBER 3

Whiteley Village, at Burhill, Surrey

AN EXAMPLE OF MODERN ENGLISH PHILANTHROPIC HOUSING

By R. RANDAL PHILLIPS

PHILANTHROPY takes various forms, and some of these are open to criticism, inasmuch as in practice they defeat the very ends for which, in theory, they were designed. But nobody could say that the philanthropy embodied in Whiteley Park and Village is not excellent in every way. The original conception was indeed fine and it has been worthily carried out.

William Whiteley was the pioneer in England of the "big store" idea which was originated in America, and the fact that he became known to everybody as the "Universal Provider" is testimony enough to his commercial achievement. His own success sprang from thrift, and he had, therefore, the greater esteem for those who had been careful with their money, so that old age should not find them derelict and empty handed. Whiteley's plan, which has been carried out, was to provide a haven in which a goodly number of old folk could spend the evening of life in tranquil and happy surroundings.

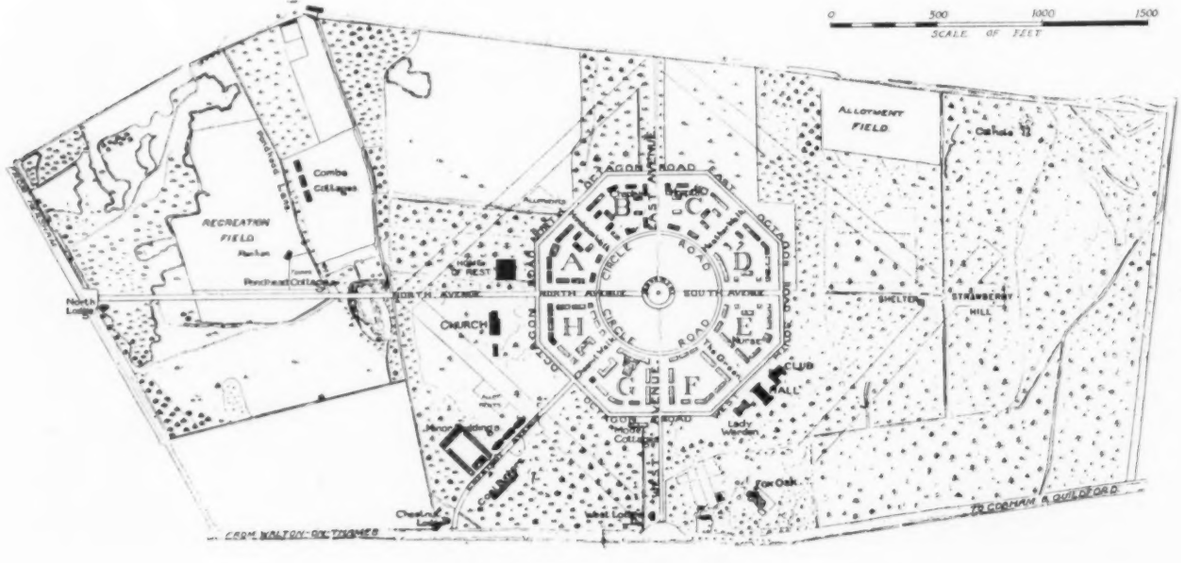
First in the practical realization of the project was the selection of a site. Considerable difficulty

View of Club House from the Green on the Southwest Side of Octagon
Sir Aston Webb, P. R. A., Architect

Entrance to Houses in Circle Road
Mervyn E. Macartney, Architect

was, of course, experienced in discovering just the spot which would meet the case, these difficulties arising from the fact that almost every good location near London had long since been appropriated. At length, however, a piece of ground, comprising 225 acres, was found at Burhill, which is a couple of miles from Walton-on-Thames and about 17 miles from Charing Cross. It is most beautifully wooded with pine, chestnut, oak and larch. There was also a considerable growth of rhododendrons, chiefly in connection with an existing large house on the estate, which was subsequently allotted to the resident agent. The site having been settled upon and acquired, the next matter was its layout. The trustees decided to invite six leading architects to submit designs for this, and in May, 1912, the design of Frank Atkinson was selected. This has as its principal feature a circle road within an octagon road, with blocks of small houses on the ground between these two, the area comprised within the octagon being 23 acres. The estate is roughly a rectangle, and in its length is bisected by an avenue running north and south, and in its width by an avenue running east and west, the circular and octagon roads coming in the center. The making of these roads was, of course, the first work to be undertaken; it was carried out under the direction of Sir John Oakley. Meanwhile detailed consideration was given to the standard accommodation that should be provided.

At this juncture it is necessary to explain exactly who the homes are intended for. Both men and women, married and single, are qualified to reside in Whiteley Village, provided that the men have reached the age of 65 years and the women 60 years, and provided also that each one has an assured income of not less than 7s.6d. per week and not more than £60 a year, or, in the case of married couples, a joint income not exceeding £75. Each applicant must be of good character and sound mind, not affected by any contagious or infectious disease, and never having been

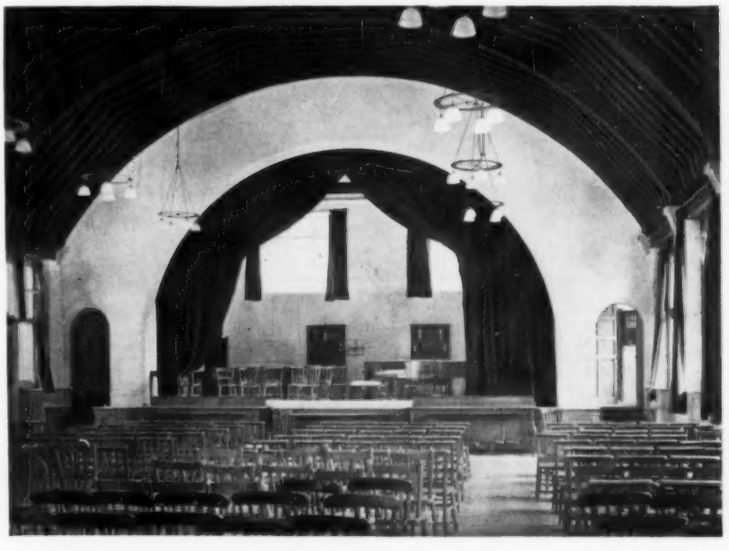


Plot Plan of Whiteley Village and Estate
R. Frank Atkinson, Architect for Layout

View of the Institute, Lady Warden's House and Houses Facing the Green
Sir Aston Webb, P.R.A., Architect

convicted of any criminal offense. From this it will be realized that William Whiteley's intention was not to provide homes for paupers, but for thrifty people, who had provided as much as they could against the time when they would have to relinquish active, everyday work, yet who had not sufficient to enable them to live on their own resources. Thus it happens that one finds people of all sorts at Whiteley Village—gentlefolk who have known more affluent days, unmarried nurses whose long and strenuous careers have not enabled them to save a great deal; working women and men from various grades of the professional and business classes. These all now find themselves comfortably housed and provided for. Installed at Whiteley Village, each has a home free of rent and taxes, a free supply of coal and electric light, free medical attention and a grant of 6s. 6d. per week. The occupants bring their own furniture with them, but this does not need to be much, for the trustees provide bedsteads, mattresses, bolsters and pillows, and curtains for the windows and bed recesses.

The village is entirely self-contained. It has its own shop, post office, institute, club room and church; a communal kitchen where a hot dinner can be obtained even today for 6d.; its own bus, which takes residents for 2d. to Weybridge and Walton Stations (both two miles away); its own hospital; a home of rest where folk can be looked after when they are too old to look after themselves, and a guest house where relations and other visitors to the old people can stay, being there housed for a very nominal sum. In the institute, concerts and cinema performances are given on weekdays, while on Sundays the building is used as a meeting place for those who do not attend the Anglican church. There is a lending library for the villagers, and the club house has a billiard room which can easily accommodate two tables, as well as reading rooms provided with newspapers and magazines. The grounds round



Assembly Room of the Institute

The Home of Rest, Facing North Avenue
Sir Aston Webb, P. R. A., Architect

about have been very pleasantly laid out, great care having been taken to preserve the fine trees wherever possible. There are three bowling greens for the residents, and at one corner of the estate is a recreation ground for the members of the staff.

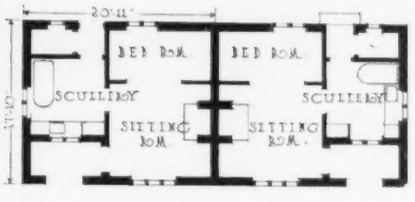
It now remains to say something about the buildings themselves and the architects who designed them. After the layout of the estate had been settled, the trustees invited seven architects to design the homes and auxiliary buildings: Sir Aston Webb, Sir Ernest George, Sir Reginald Blomfield, Ernest Newton, Mervyn Macartney, Frank Atkinson and Walter Cave. To each was allocated a certain portion, and in order that the effect of the entire group of buildings might be harmonious, the architects were instructed to use the same materials, and to keep more or less to one general character of design. Before the writer visited the village he had been told that the desired result had not been completely attained, inasmuch as the work of one architect did not fit in well with that of his neighbor; but two visits of inspection have removed this impression from his mind. It is true that all the work is not of equal merit, certain of the architects having been more successful than others, but the very disposition of the buildings within the octagon, set amidst the fine old trees, disarms the criticism that the buildings do not harmonize well—for the reason that from no one point can they be seen in their entirety. Only a section can be seen at a time, and the photographs here reproduced will serve to show how pleasing in general the houses are. They are all of brick with tiled roofs, and so soundly built in every part that they give a feeling of stability. All too often houses are spoilt by restrictions in cost, and this results in poor building. In Whiteley Village the very opposite is true, for here the best materials have been used in the very best way. There is nothing shoddy

Houses at Corner of Hornbeam Walk and Circle Road
Ernest Newton, R. A., Architect

anywhere. The houses are meant to last, and they look like it.

The institute, with club house and lady warden's house to right and left, is set on a small plateau reached by a short flight of steps, and the approach to these main buildings is by way of a very charming green. Sir Aston Webb was the architect of this portion of the village, and also of the home of rest. The adjoining section of the octagon group to the south was apportioned to Mervyn Macartney, who has carried out the unpretentious and satisfying form of simple building which was common in England during the early part of the eighteenth century. The next section of the octagon, to the east, is by Sir Ernest George, who also designed the corresponding section on the north side. In between these two are the houses designed by Ernest Newton, typically his in their good proportion and pleasing, straightforward form. The flanking groups to North avenue are by Sir Reginald Blomfield. Then comes the section, including the village shop and post office, by Walter Cave, and lastly there is the western section of the octagon, by Frank Atkinson, who also designed the north and west lodges. From the experimental cottages built from Mr. Cave's design a standard plan unit was evolved. This has been followed throughout, though combined in various ways, both in one-floor and two-floor buildings, and enlarged in the case of the homes occupied by couples. The unit plan comprises an entrance porch, a living room with a bed recess (both lighted separately by windows), and scullery. The living room has a small range, and a dresser in an adjoining recess. The scullery opens directly out of this room. It is equipped with a sink, a gas cooker and a bath. Gas is supplied on the penny-in-the-slot system, and for the convenience of the old folk the bathtubs are placed on the floor, without legs. The sculleries have tiled floors, and the walls round about the sinks are white tiled; in fact, the interior equipment is excellent in every way. Each of the eight sections of the octagon has a staff cottage in telephonic communication with the administrative center, and each home is connected with the

Pergola between Houses on Circle Walk
Sir Aston Webb, P. R. A., Architect



Pair of Cottages off East Avenue and Typical Floor Plan
Ernest Newton, R. A., Architect

North Lodge and Gate at End of North Avenue
R. Frank Atkinson, Architect

staff cottage, so that in case of illness or accident, help can immediately be given.

The church, dedicated to St. Mark, is a very delightful example of Walter J. Tapper's work, full of true feeling, and imbued with a sense of repose and refinement. Set in the middle of the octagon is a monument to William Whiteley. It consists of a tall stone pedestal, surmounted by a female figure holding a beehive, typifying Industry, while on the face of the pedestal is a bas-relief plaque of the founder himself. Sir George Frampton was the sculptor, and Walter Cave designed the architectural setting. It is interesting to note that sealed up in a bottle beneath the foundation stone is a parchment plan of the octagon, with the general layout, and on this plan are written the names of the trustees, the architects and the contractors.

The laying of the foundation stone of the monument was the beginning of actual building operations on the estate and took place on July 21, 1914, but in less than a fortnight the great war had burst upon Europe, and, like many other projects, this was abandoned. It was not till October, 1917, that the first villager took up residence. Since then the work has been proceeding apace, so that at the present moment there are nearly 300 old folk in the village, the greater majority of them being single women. Eventually it is hoped to increase the accommodation to 500, but in view of the persisting high cost of labor and materials, no further building on an extensive scale is being undertaken It rarely happens that an institution of this size is carried out in such good taste with so homelike an atmosphere.

Houses on Circle Road at the Junction of the Green
R. Frank Atkinson, Architect

BUSINESS & FINANCE

C. Stanley Taylor, *Associate Editor*

Straight Talks to Architects

VI. USING PRACTICAL INFORMATION TO STIMULATE YOUR PRACTICE

EDITOR'S NOTE: How many of the building projects under consideration in your office today will develop into actual commissions—and when? This is the vital question facing every architect today.

Is there any logical way in which the architect can encourage immediate construction activity through his office? Read the letter in the first part of this article.

What practical information regarding general economic trends and conditions should the architect possess? Where can he get this information? How can he use it to better his service to clients?

ECONOMIC conditions have brought about in the average architectural office today an unusual business situation. Perhaps at no time in the history of the profession has there been so much contemplated work in view, but why are clients hesitating? The recent survey conducted by THE ARCHITECTURAL FORUM indicates the planning of approximately four billion dollars of construction work on which architects will earn commissions when clients decide to build.

The purpose of this article is primarily to give to the architect certain information regarding conditions in the building field which if presented to the client may assist materially in bringing about a decision to build in the near future. The possibilities opened up by this form of service on the part of the architect cannot be better illustrated than by presenting for consideration a typical letter which was recently received by THE FORUM from a New England architect. This letter is quoted in full:

"In talking over the building situation with prospective clients recently, I have had occasion to refer to the chart which you published on the 47th page of the January issue of THE FORUM, and have found it one of the most satisfactory reasons why building may be safely undertaken at the present time and one of the most convincing illustrations which can be given.

"Today in talking with a school committee I used the chart and they were so impressed that they wondered if they could not have a write-up for their local papers, with a chart of similar character but possibly somewhat simplified for easier understanding by the laity. I presume that you have no objection to such use of the information given in the chart and would appreciate your permission to use it in that manner."

The information referred to in this letter is the chart similar to that shown on the first page of the Service Section (page 59) in this issue. This chart, which is presented each month, conveys this information:

1. An index line showing the trend of building cost.
2. An index line showing the trend of general wholesale commodity prices.
3. A curve and area of stabilization which indicate the point in the general construction cost chart at which an owner may safely proceed with a building project without fear of too great a deflation of the reproduction value of his building.
4. Trend lines indicating the amount of money invested in new buildings each month and the volume of this construction.

It is not to be wondered at that many prospective building owners hesitate to proceed with actual construction, because of their lack of any definite measure as to future conditions. There exists also the general impression that financing for building construction is hard to obtain and that disturbed conditions of labor and material prices indicate difficulty and considerable added expense to the owner who undertakes building now. This state of mind is based naturally upon occurrences during the past few months, in the course of which the cost of building has declined materially, and the public press has many times indicated serious disturbances in the field of building labor.

What has actually taken place? There has been an unusually rapid deflation of building costs, dropping to a comparatively low level in a short period. It is but natural for the average prospective investor to believe that this momentum will carry prices much further down. While it is undeniably true that the average trend of building costs over the next few years will be downward, it is also true that this continued deflation will be in a much less marked degree and that this period will be one of ups and downs in the market resulting in only a slow, general, downward trend.

In regard to financing of new buildings, there has been considerable change in the last two or three months. There is more money available for building and permanent mortgages now than at any time during several past years. It is a fact

that practically no useful building operation need be delayed because of the lack of mortgage money unless it is desired to operate on a slight margin of equity, beyond reasonable requirement from a business viewpoint. Finally, while we can look for no drastic reduction in material prices, it must be realized that there has been a marked increase in the hourly production of building trades labor. In the Service Section of this issue of THE FORUM we give some definite figures obtained directly from construction contracts, showing that while labor rates have not been materially reduced, the production of labor has most certainly increased. We have shown also another factor worthy of consideration, that is the saving of building cost due to brisk competition on the part of general and sub-contractors. As this point was completely covered in the February issue, it is not necessary to go into details here.

The important consideration is that the architect should realize the value of conveying such information to the prospective building owner who, as his client, is hesitating to proceed with a projected operation. In the letter just quoted we have shown what happens when such information is intelligently presented to a client, and we know from many office conferences with architects that this information is received with great interest. Not only has it definite value in helping the owner to make his decision, but it is also important in that the possession of such knowledge reflects credit upon the architect and increases the value of his services to the owner.

A natural question arises, "Why is the owner not in a position to get this information for himself?" Our only answer to this question is that there is no specific source of information covering all these points, and that the owner can reasonably expect the architect to be better informed on such subjects than he is himself. We do not doubt that there are literally thousands of projected building operations under discussion in architects' offices today which might be stimulated into actual construction activity if practical steps were taken by the architect to familiarize owners with actual conditions in the field and to take advantage of the present competitive state of the market to thoroughly comb out low sub-contract figures which would reduce the cost of the project to a point meeting the approval of the owner.

It may be interesting to note the general impression that building costs have increased slightly in the late winter months. This opinion has been based on the fact that there has been some increase in the cost of a few basic materials. It is not generally realized, however, that the various factors such as increased labor efficiency and contract competition have had a tendency to continue the decrease in cost of building. In fact, the trend line of building costs shown in THE FORUM'S graphic chart has shown a slight upturn until this issue, in which it has been corrected. This line has been based on the costs of materials and labor and it is only through an analysis of actual building costs and estimates taken from the offices of contractors and architects that we realize that building costs have not gone up again—even slightly. It will be noted, therefore, in the chart shown in the Service Section of this issue that we have weighted the line of building costs for the last three or four months by the factor of increased labor production and the saving due to active competition by subcontractors and general contractors. This line now represents very fairly the trend of general building costs.

In addition to presenting this graphic chart showing conditions in the building field, the entire Service Section of THE FORUM is given over to the presentation of facts and figures bearing on building costs, financing, labor conditions and other factors of direct interest to those who contemplate investment in buildings of any type. It will be noted that in the Service Section there is presented each month a digest of important information, conveyed through many publications, which has a direct bearing on the economic phases of the building situation. It must be realized that all this information is presented for the *active use of the architect* rather than to convince him regarding conditions in the field. Every item of information presented through the Service Section will be found of interest to some client, depending on the character of building in question. Certainly any architect who desires to do so might collect this information for himself, but it would be necessary for him to be in touch with many sources of such information and to read many publications each month to acquire the store of information presented through the Service Section.

* * *

The complexity of the modern building (as compared to those of several decades ago) has been a result of the increasing complexity of our commercial and social relationships. We must realize that the advance in the art and science of building construction is after all a result rather than a cause. It is the result of definite demands brought about by the concentration of commercial activities in certain districts of great cities and by the segregation of residential areas chosen as being more desirable than others. These are the basic factors in bringing about an increase of land values. In congested city districts land values have forced expansion upward, and with each added story of building height came new complications of construction, operation and maintenance. Standards of living have been raised and have been expressed in a demand for increased comfort and better conditions under which domestic and business life might function.

Thus we find an absolute demand that architects include in their professional equipment some knowledge of what might be termed the economics of their profession. It is already a recognized fact

that modern architecture is complicated by engineering problems of various types, and it must be equally recognized that the practice of architecture today is to a certain extent complicated by the financial and business problems of the client. We may here emphasize the point that this condition applies to the entire architectural profession, not alone in America but in other countries as well.

In England, Sir Charles Ruthen, President of the Society of Architects, has within the past few weeks delivered an astounding address to the members of his organization. It will interest readers to consider briefly some of his remarks:

"The architectural profession as a body does not do well; it lives too much on its glorious past. I want to make it clear that we do not study our profession in the true professional spirit. We are divided against ourselves. We should first consider the state in which we live, then consider each other a little more. We are not sufficiently related to the commercial, competitive age in which we live, and we must bring ourselves into line with it.

"It is well known to a small group within the profession, that much of recent years has been heard of what are considered to be the proper modes and methods of providing efficient architectural education. The general public knows nothing of these momentous discussions, carried on energetically and almost continuously by a mere handful of professional enthusiasts, and has little knowledge of the real value of the architect and his craft to modern progress and civilization.

"Some, but comparatively few, understand the architect and value his work. Many others look upon the architect as a kind of necessary and expensive evil, mainly useful in connection with building matters, in avoiding difficulties in relation to regulations and by-laws, but generally a costly luxury and to be avoided whenever possible. The fact is very surely borne in upon one, that the great public has not the faintest idea of the important part played by the members of the architectural profession in the everyday life of the people, and one wonders whether the architect attaches to himself any share of the blame for this fatal ignorance, or whether he sometimes stops to think, and perchance realizes, that this lack of understanding is after all due in part, if not in a large measure, to a strange backwardness upon the part of the entire profession.

"Architecture is not an insignificant craft; it is not valuable or useful only to a few; it is necessary and essential to the full life of the nation, and should not be kept in the background. We may have come to the end of a long chapter in the history of architecture, or we may be reaching that point, but there are other important chapters to follow. We cannot, and should not, expect to live on the past reputation of our art. The greatness of its past should not prevent it from having a great present and a great future. Let us attempt to put behind us all preconceived ideas of what is proper or improper from the points of view of professional etiquette, and let us endeavor to apply to the necessities of the age in which we live a consideration of the value of the real science of building and architecture, so far as the latter term is applicable to the requirements of the people and the state, in regard to healthy and happy existence, and apart altogether from the art of the craft in the artistic or æsthetic sense.

"Architecture, it will be generally agreed, is a very wide and comprehensive term, and although there are thousands in this country who do not avail themselves of the services of the architect, it is yet passing strange that all the defects in all the buildings that are erected are ingeniously placed at the door of the architect.

"One would ask again, Does the architect occupy the place that is his due in the social structure of today, and has he taken his share in the burden of the present time? Is he in experience and knowledge, and by training, competent to undertake the duties he owes to the state? Is he serving his profession in the fullest sense, without giving his proper quota to the matters which are vital to the state?

"I want to be understood as discussing all these matters, not with the eminent and distinguished, but with the *struggling and trained efficient young practitioner*, the backbone of the profession!

"The fact is that the architect consistently ignores the science of his craft (and he is taught studiously so to do), and clings tenaciously to the art. He is supinely unconscious of the place of architecture in the structure of modern life."

These remarks, and others somewhat more caustic in nature dealing directly with conditions peculiar to practice in England, have resulted in focusing considerable interest on this subject. Naturally, many architects have constituted themselves critics of Sir Charles Ruthen, but it is interesting to note that many leading members of the profession have shown constructive interest and a recognition of the need for broader educational policies in the development of the coming generation of architects.

There can be no question that the complexity of problems which faces the architect today results from unusual development of the building industry, which next to agriculture is the greatest single industry in the United States. There is another fact which often escapes attention and which certainly is not recognized by the public—that is, the power of influence which is exerted by the architectural profession on standards of living. We find upon analysis that practically all improvements of living conditions are based on precedent established by the architect. An architectural competition in New York held 20 years ago resulted directly in the establishment of the so-called "new law" type of tenement house, a departure which was followed by builders and investors in this class of building and which resulted in great improvement of the living conditions of those

having small incomes. Incidentally, another such competition has just been held in New York and it is safe to predict that a definite measure of improvement in low cost city housing will follow. Similarly, in the higher class residential field it is the architectural type of dwelling which is being more generally favored by the public than ever before, and the architect is really a pioneer in the use of modern utility and comfort-giving equipment for residential structures. It was an architect who introduced steel construction and made possible the towering commercial buildings of America,—in fact the influence of the architect cannot be overestimated, at least insofar as the standards of living and æsthetic appreciation may be concerned.

Architects must realize, however, that the rapid development of our economic structure has brought with it a definite demand for a service secondary only to that of design, and in certain classes of buildings exceeding even design in its importance to clients. The ability to give this secondary service (which for want of a better term we may call the economics of building construction) is already possessed in a number of active architectural offices. Its results may be recognized definitely in an analysis of successful modern buildings. It is the result of appreciating the fact that the modern building calls for the best in many fields of knowledge. It requires several types of engineering service; it requires understanding on the part of the architect of the nature of the purpose for which the building is to be used; it requires a knowledge of modern building finance, including a capacity to understand the functioning of buildings as investments; it requires a full measure of co-operation between the owner and his organization, the building manager, the contractor and the architect. It admits the value of special service by experts familiar with the financial and utility phases of the individual building problem. When we boil down this somewhat theoretical statement to an active project, such as the Cunard Building described in the July, 1921, issue of THE ARCHITECTURAL FORUM, we find it possible to establish a definition of the successful architect which will apply throughout the progressive centuries to come. The successful architect, now and in the future, is he who with full appreciation of his art will include in his professional equipment an appreciation of the modern science of building and the modern economics of the building field. One cannot and does not expect the architect to possess the great store of diversified knowledge which is called for by building projects today, but he is expected by the public to appreciate the business problems of the owner and to bring into co-operation with his efforts all knowledge and expert advice which will constitute a completely rounded and efficient service from the owner's viewpoint. He will help the owner to protect himself against a bad investment in the building field; he will use available consultation service to solve any problems which he is not able to solve himself, and he will endeavor in every possible way to keep himself sufficiently posted on the conditions affecting the building field to be able to discuss intelligently with his client those problems which relate not to design and equipment alone.

When we find today architectural organizations maintaining engineering departments, or recognizing the value of consulting engineers in relation to special building problems and maintaining within their organizations men well versed in modern business problems and methods, we find almost invariably successful and active organizations. Similarly, in an analysis of smaller organizations in which the principals are possessed to a degree of such general knowledge or at least a definite appreciation of such knowledge, we determine the class of architects who will control this professional business in the future. These are the men and the organizations capable of progress and expansion. The younger architects who are developing their careers in this atmosphere are losing none of their appreciation of all that is fine in architecture but are developing their capacity to make theirs an applied knowledge, of benefit to the community and to themselves. It is true that there will always be a few exceptions to this general rule,—perhaps designers of unusual ability and favored by fortunate circumstances. It is a safe prediction, however, that under these conditions those architects who are not receptive and who offer resistance to progress represent a class which will disappear before many years have passed. Professional ethics is a conventional term, and in many instances it is a convenient cloak for bad business practice as represented by inefficient building design, which costs the public dearly and brings to all architects a measure of criticism which is often unwarranted.

There are those who hold that the architect must keep aloof from the business world, selling his art to those who come to demand it, but the modern business world is building for success. Impracticability, however tempered by artistic achievement, is rarely to be forgiven and it is clearly the architect's duty to himself to use every possible means to broaden his own knowledge and equipment for service. He must read more comprehensively; he must keep alive to the practical developments in his own field,—in other words he should know his own *business* as well as his art.

* * *

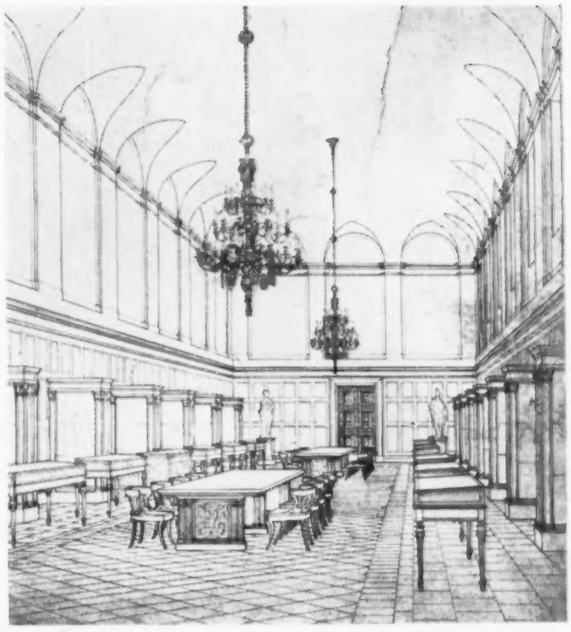
We realize of course that the "Straight Talks to Architects" have not direct application to every architect. In the course of their presentation through this and past issues of THE ARCHITECTURAL FORUM, we have endeavored to limit them to frank, unbiased statements which have been brought to our attention through an analytical study of professional activities and to make them serve as constructive assistance in shaping policies of the unreadable future.

The Henry E. Huntington Library

MYRON HUNT, ARCHITECT

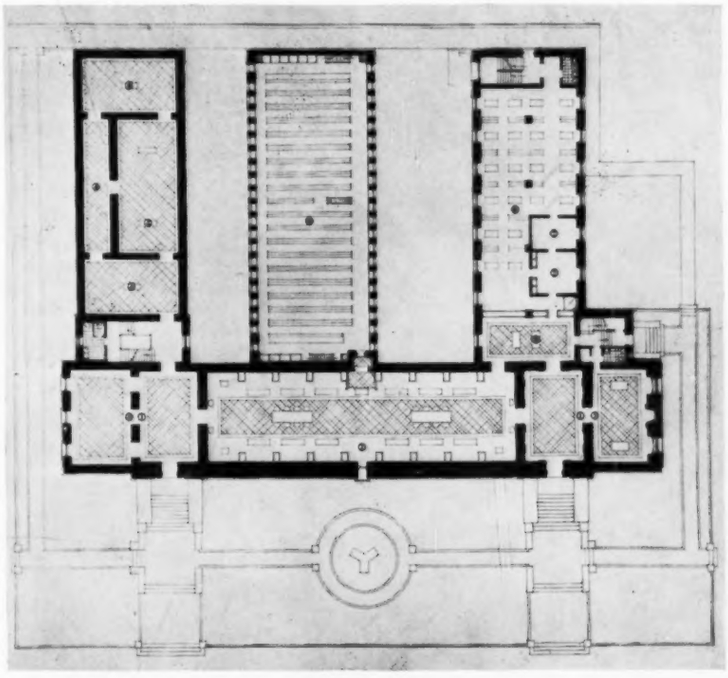
THE building up of the colossal fortunes which are many in America today sometimes makes possible achievements in other ways which are probably quite as characteristic of the spirit of America. Thus the acquiring of vast wealth affords the opportunity of creating foundations for educational purposes or for the promotion of medical or sociological research, or else it may take the form of establishing great centers for the study of literature or art.

A notable instance of the realization of a lifetime's dream is gradually assuming form at San Marino, California. In this sunny corner of the golden West, Henry E. Huntington is establishing what must ever be a magnet to attract to itself students of art and literature from all over the world, for here are being gathered the supreme treasures which have been garnered from all the countries of the globe—a gathering into one building of the rarest parts of many great collections, the smallest of which has been built up by years of patient effort added to great expenditure. The library is part of an estate covering 700 acres, and the plan of its owner is that the estate, with the library and its artistic and literary treasures, shall eventually become the property of the state of California. Although the library will hardly be opened for public inspection for two years, already 120,000 volumes are in place and are being catalogued under the direction of a trained librarian.



Design for Main Book Exhibit Room

The building into which these treasures are being assembled is itself notable. Built in the renaissance style, it presents an appearance of rich but refined luxury. The main facade includes a pylon at each end, in which the entrances are placed, while between these pylons and placed upon the high basement story rests a series of engaged marble columns which support the entablature and cornice, above which there rises the low pitched red tile roof. The structure is planned upon the model of a letter E, the middle wing being devoted to the stack room. The remainder of the building is planned as reading and exhibition rooms, an office for the personal use of Mr. Huntington and offices for the librarian, assistant librarian and the staff of catalogers. The catalog files are so arranged that their drawers may be removed from either the catalog room or from the room in which the catalog work is done. In addition to the main book exhibition hall, which extends the full height of the building and which occupies the greater part of the space within the main part of the structure, there are various smaller rooms



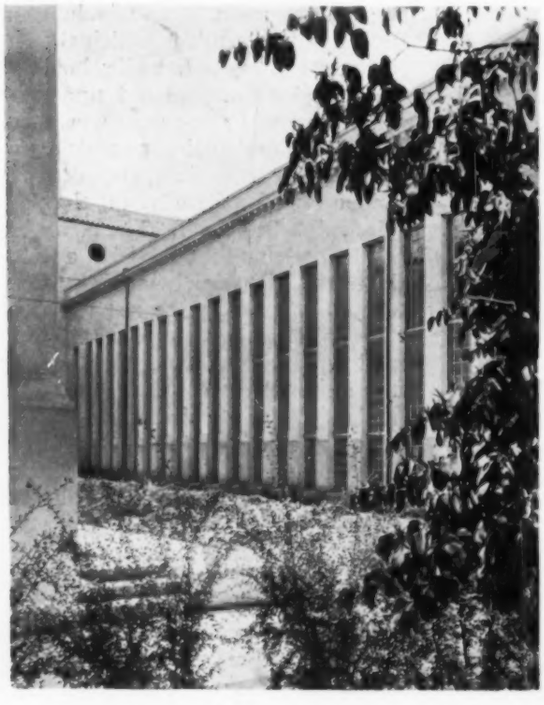
Main Floor Plan

1. Entrance Lobbies. 2. Book Exhibit Hall with Plenum Chamber Below. 3. Founder's Room with Boiler Room Below. 4. Exhibition Rooms with Storage Space Below. 5. Catalog Lobby. 6. Cataloging and Seminar Room with Distribution Stacks Above. 7. Librarian's and Assistant Librarian's Offices. 8. Middle Floor of Three-story Stack Room with Plenum Chamber Under

intended for the exhibition of prints, provided with wooden, cloth-lined walls and lighted from skylights.

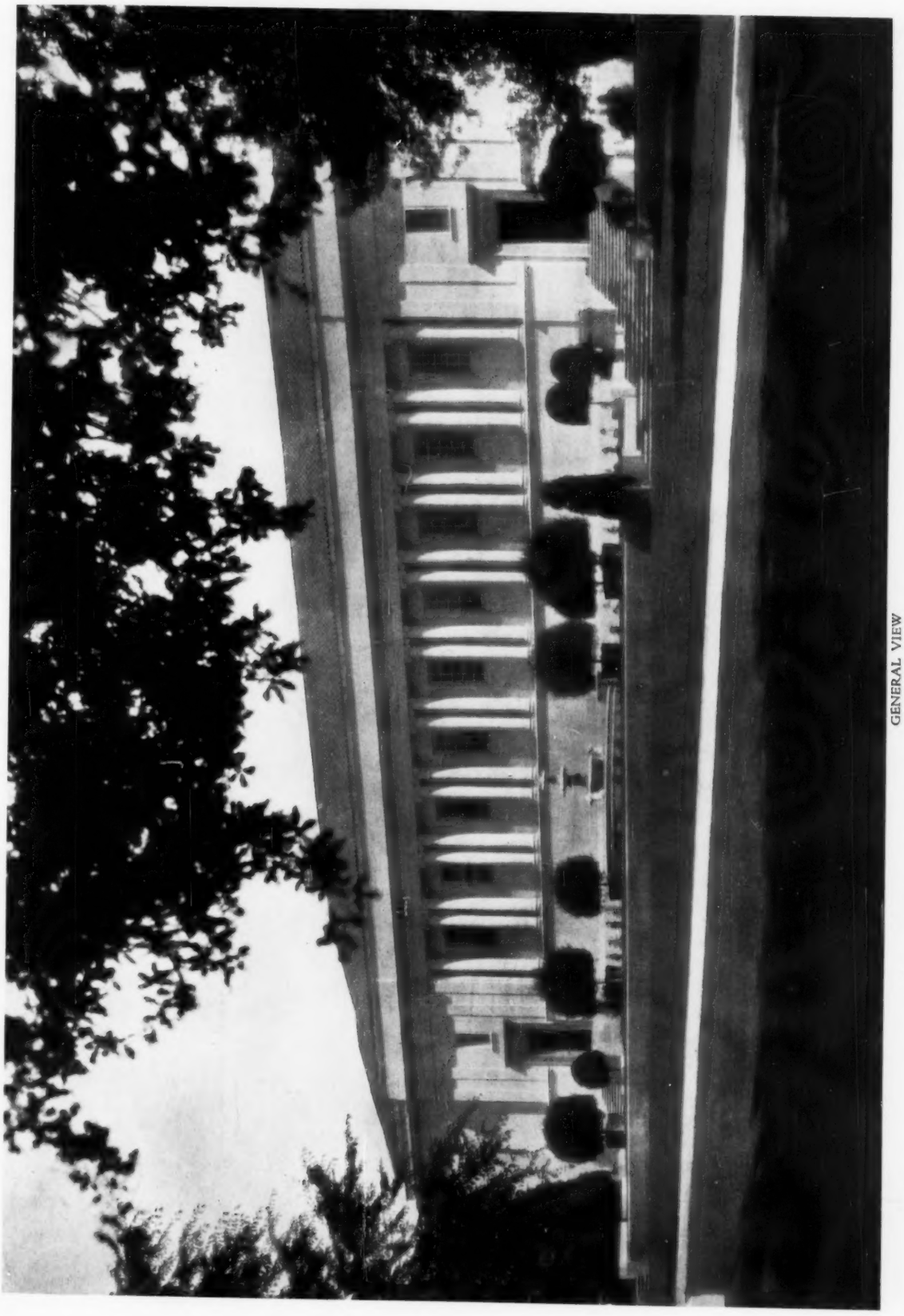
The main stack room is the last word in planning and equipment and includes every possible provision for safety and efficient working which has thus far been introduced. This wing of the building is three stories in height. Below the floor of the stack room there is a plenum space which allows for the intaking of fresh air which is humidified in the dry season by the evaporation of water placed in pans, the air being drawn beneath the book stacks, up through the books themselves and then out through the double roof. The arrangement which governs the regulation of humidity is not dependent upon the use of fans, as is generally the case, but is produced by the action of the sun on the upper roof which heats the 5-foot plenum above the main ceiling, the cool and temperate air being drawn upward through registers in the lower ceiling and then out through copper ventilators in the upper ceiling by the action of the sun in heating the upper roof plenum. The book stacks are of course arranged in rows or aisles, and each is separately locked with its own gate; in addition, each of the individual cases in each aisle is also grated and locked, and to provide every possible detail of protection the windows are fitted with hollow metal sash with panes of about 10 by 12 inches, a standard bank vault electric alarm system having been installed in the muntins. In the event of any wire or framework of the glass being broken, a monster gong situated on top of the building begins to ring and will continue to ring until the connection of wire or framework is mended. The safety of the stack room is made additionally secure by reason of the fact that but one doorway gives access to it; this entrance is in the main exhibition room, and behind the heavy bronze screen is placed a vault door such as are used in banks. The bronze doors which give entrance to the library at either end of the terrace are richly ornamented in the spirit of the Italian renaissance. The doors proper are arranged with eight panels, with two additional panels above which serve as a transom and give the effect of a higher opening when the doors are closed.

One Pair of Main Entrance Doors



Light Court Showing Stack Room Windows

Rear Walls of Catalog, Stack and Exhibit Wings



GENERAL VIEW

LIBRARY FOR HENRY E. HUNTINGTON, ESQ., SAN MARINO, CAL.

MYRON HUNT, ARCHITECT

MAIN FACADE FROM THE SOUTHWEST

LIBRARY FOR HENRY E. HUNTINGTON, ESQ., SAN MARINO, CAL

MYRON HUNT, ARCHITECT

GENERAL VIEW

CONVERSE MEMORIAL LIBRARY, AMHERST COLLEGE, AMHERST, MASS.

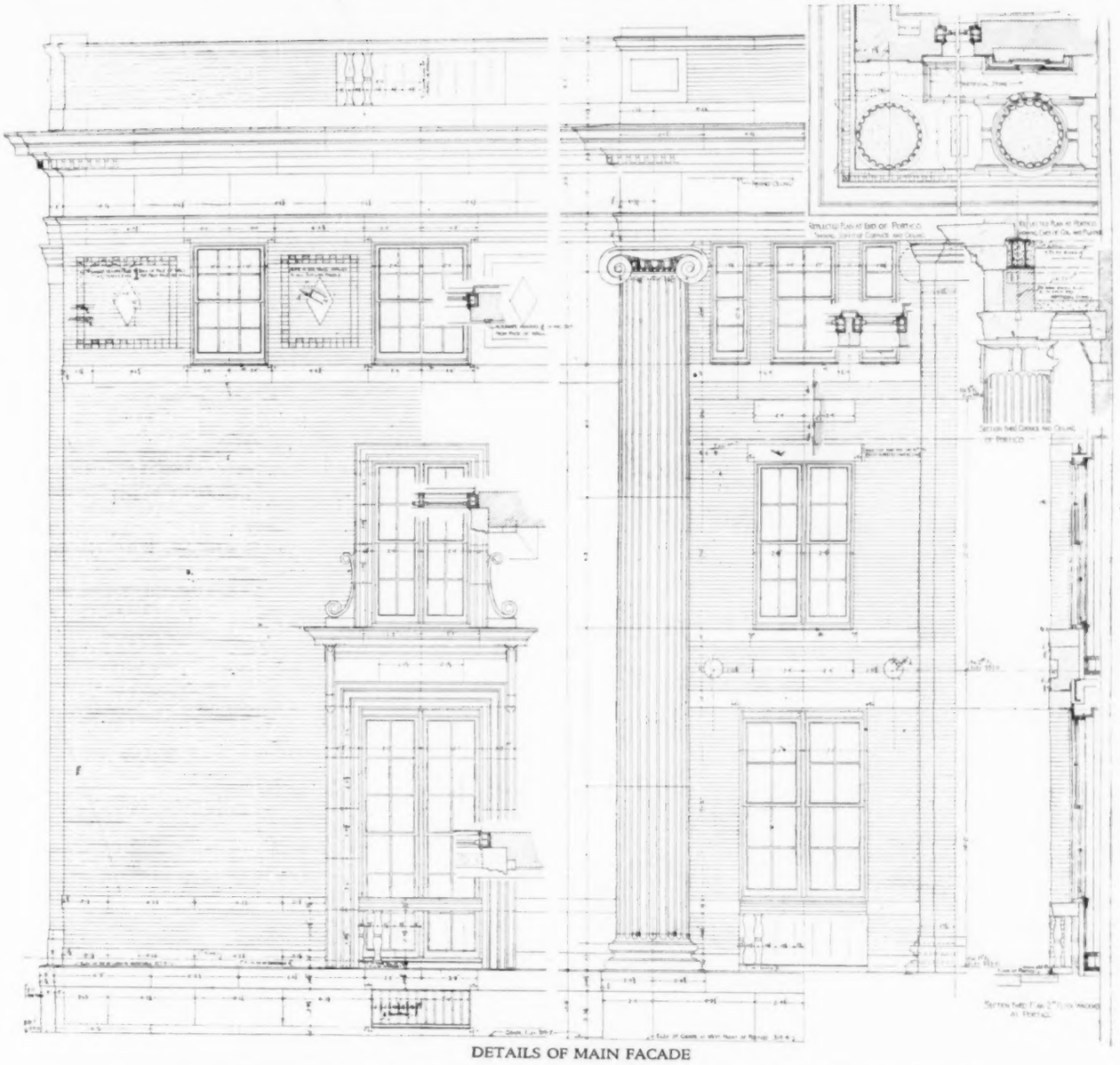
McKIM, MEAD & WHITE, ARCHITECTS

VIEW OF DELIVERY SPACE

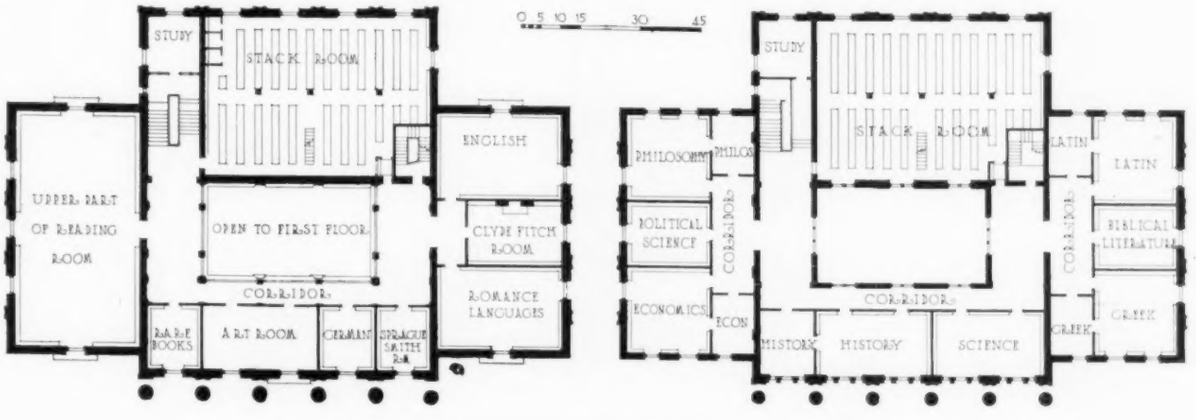
BASEMENT AND FIRST FLOOR PLANS

CONVERSE MEMORIAL LIBRARY, AMHERST COLLEGE, AMHERST, MASS.

McKIM, MEAD & WHITE, ARCHITECTS



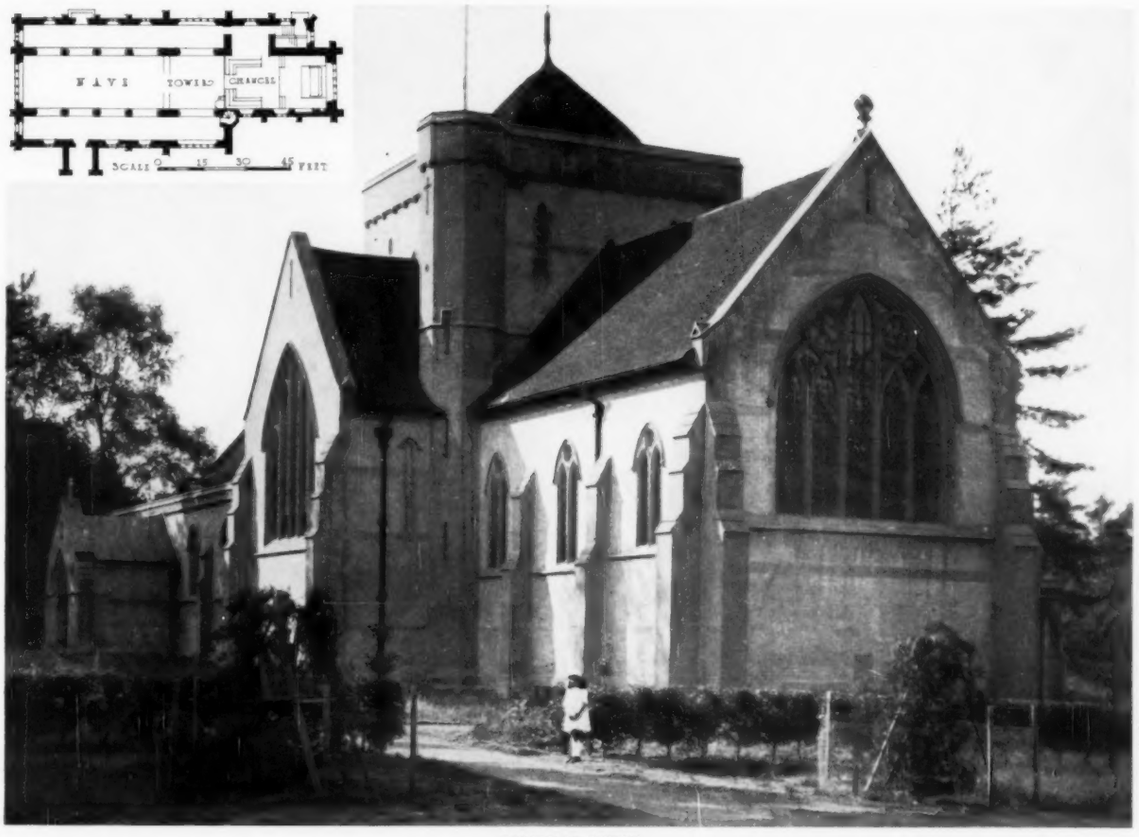
DETAILS OF MAIN FACADE



SECOND AND THIRD FLOOR PLANS

CONVERSE MEMORIAL LIBRARY, AMHERST COLLEGE, AMHERST, MASS.

McKIM, MEAD & WHITE, ARCHITECTS



GENERAL VIEW

VIEW IN NAVE

ST. MARK'S CHURCH, WHITELEY VILLAGE, SURREY, ENGLAND

WALTER J. TAPPER, ARCHITECT

CIRCLE ROAD

HOUSE ON CHESTNUT WALK

WHITELEY VILLAGE, SURREY, ENGLAND

ILLUSTRATING WORK OF WALTER CAVE AND SIR REGINALD BLOMFIELD, ARCHITECTS

Office Buildings for Individual Occupancy

ILLUSTRATING THREE RECENT NEW YORK BUILDINGS

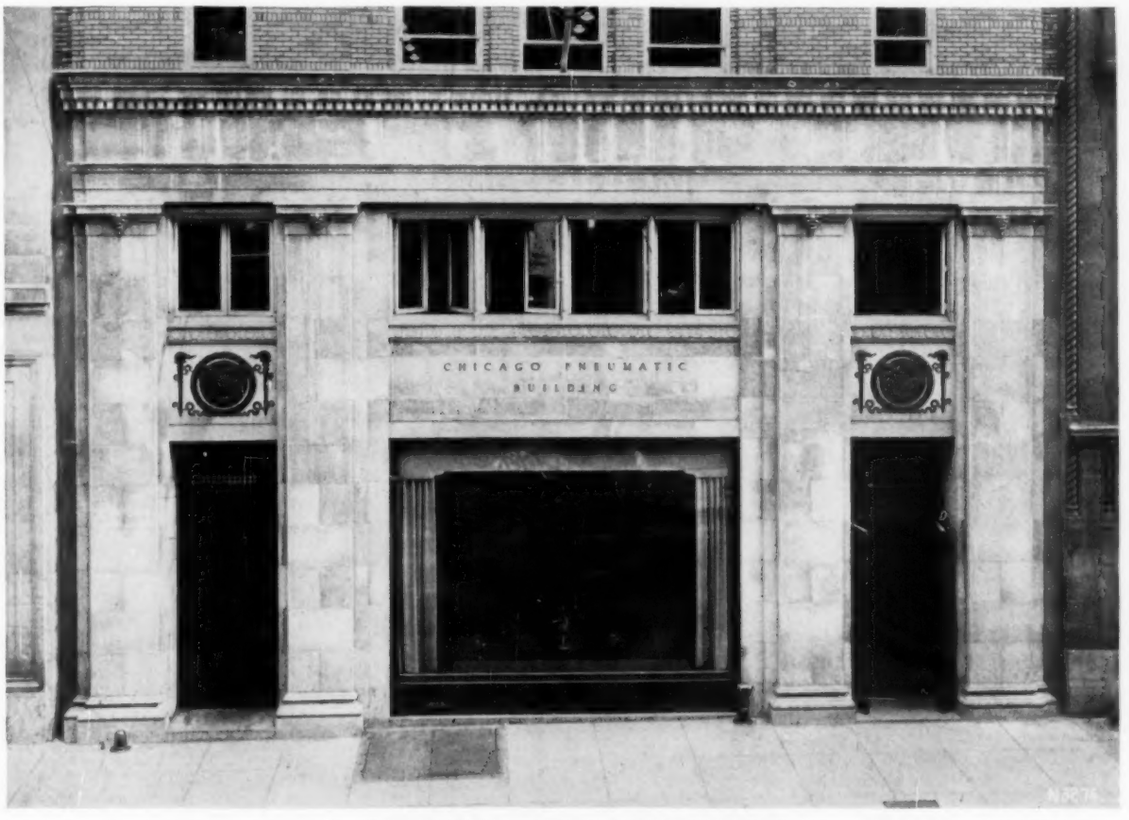
THE increasing difficulty of obtaining suitable quarters for high class businesses of different kinds in New York's congested retail district is among several reasons which have contributed to the practice of erecting what might be called the "individual" building. In many instances the structure is larger than is actually required for the immediate uses of the owner, the surplus space being leased to acceptable tenants until the growth of the owner's business shall make necessary its occupancy of the entire premises. The height of such a building is naturally governed by much the same economic aspects as regulate the height of any business structure, such as the original cost, costs of maintenance, and the probable rates of rental which may be obtained, the object being to make such a building reasonably profitable financially even when it is arranged largely for the owner's specific use and occupied chiefly by him.

Douglas L. Elliman & Co., Inc., Building

Cross & Cross, Architects

An excellent example of such a structure is that at 15 and 17 East 49th street, owned by Douglas L. Elliman & Co., Inc. The growth of this firm since its beginning in 1911 has involved the outgrowing of three different sets of business quarters and it was desired to provide here a structure which would afford space for any anticipated growth for the owning concern in addition to the three lower floors which it now occupies. With this end in view the 10-story structure has been built upon a plan so flexible that it may be readily adapted at very little expense to any future requirements. The floors now occupied by the company are connected by private stairways, and other floors could easily be included in their premises. These three floors as well as the seven stories above, now under lease to various tenants, are readily accessible by the elevators from the public hallways.

The floor plans of the quarters of Douglas L. Elliman & Co., Inc. indicate the completeness of the real estate, brokerage and insurance service which the firm renders to its clients. Upon the front of the ground floor there is the reception or waiting room for customers, back of which at the far end are the private offices of several members of the firm, the greater part of the area of this floor being given up



Lower Stories of Chicago Pneumatic Building, New York
C. W. Fairweather, Architect

Facade Chicago Pneumatic Building
C. W. Fairweather, Architect

to the desks of the solicitors, the records to which they require constant access and the "closing room," useful for concluding business arrangements and signing documents. Upon the floor above, a door from the public hall opens into a clients' reception room while the entire front of the floor is given up to the needs of the firm's insurance department. The remainder of the floor is occupied by the cashier's department and the quarters of those concerned with the management of buildings of different kinds. The front of the third or upper story of this firm's premises is arranged as private offices, the rear portion for the department devoted to the selling or leasing of country properties, while the area between is given up to the mailing and filing rooms, the telephone exchange and space for clerks and stenographers. The building was constructed by G. Richard Davis & Co.

Combustion Engineering Corporation Building

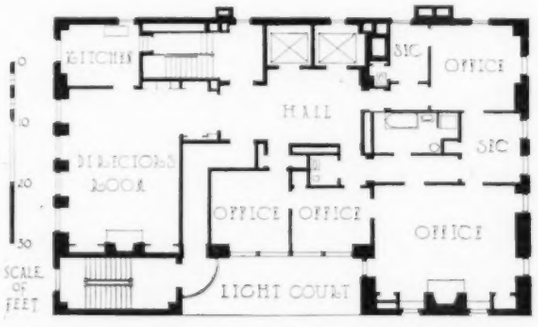
Ludlow & Peabody, Architects

Another interesting example of a building constructed for an owner-tenant is that at 43 Broad street owned by the Combustion Engineering Corporation. Here the owning concern occupies what is perhaps the least desirable part of the building—the three upper floors together with part of a fourth, the lower floors commanding higher rentals. The third floor of this structure is occupied by a banking and brokerage concern, and one interesting detail of the floor consists in planning a separate room for messengers and runners, reached by its own entrance from the public hall. The building was erected by the George A. Fuller Co.

Chicago Pneumatic Building

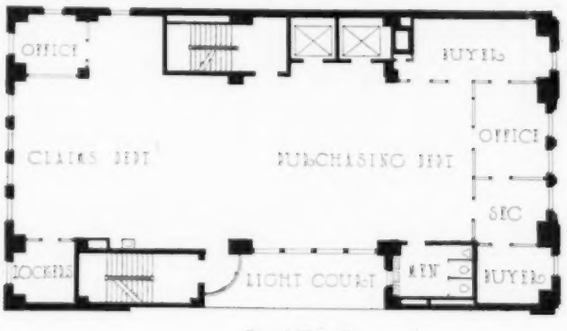
C. W. Fairweather, Architect

At 6 and 8 East 44th street is the 10-story and basement structure owned by the Chicago Pneumatic Tool Co. This building was designed en-



Tenth Floor Plan

First Floor Plan

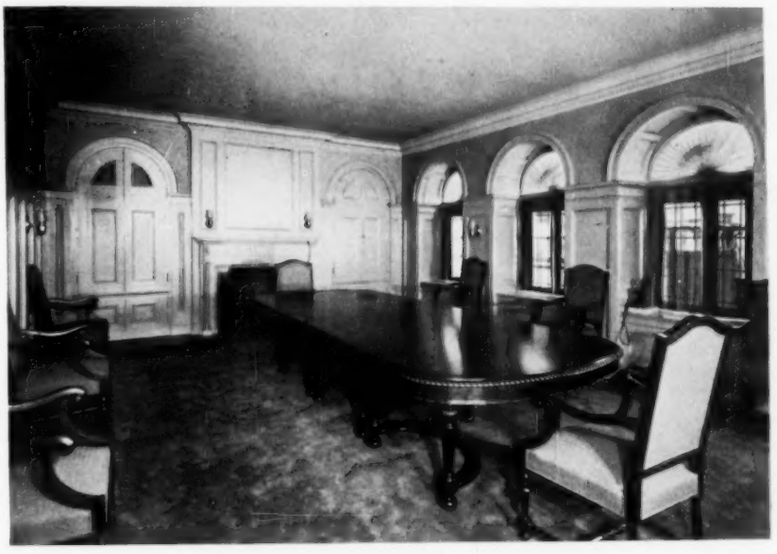


Fourth Floor Plan

Chicago Pneumatic Building, New York

tirely for the occupancy of its owner, making possible many features in working out the plan which are generally lacking in the typical loft structure built for renting purposes.

Throughout the design and construction of the building careful attention was given to considerations of practical economy, with the result that the owners have secured modern offices designed specifically for their use at a cost approximately half that asked for similar space in the neighborhood.



Directors' Room, Chicago Pneumatic Building

At the inception of the work, a study of the requirements developed the fact that 10 stories and a basement were needed to take care of the immediate needs of the owners and prudence suggested that the frame be designed to permit, at some future time, the construction of five additional stories if extra space were required. In designing the frame, consideration was given to the method usual in office buildings measuring 50 by 100 feet of providing a line of columns on the central axis and spanning from these to the side walls. But at slight additional expense, and by a judicious spacing of elevators, stair and fire towers, it was found possible to eliminate detached columns altogether and provide a working space of maximum efficiency. Most of the floors are entirely open, as shown upon the plans, and such private offices as are required are partitioned off with open glass partitions.

To meet the requirements of the city's building laws, a light shaft had to be built at the rear of the property only, but because no room 90 feet long can be adequately lighted or ventilated by front and rear windows only, a side shaft was built, extending from the second floor up and having an area of 300 square feet. Rather than save a story and have all

First Floor Salesroom, Chicago Pneumatic Building, New York
C. W. Fairweather, Architect

Detail of Office Partitions, Chicago Pneumatic Building

floors dark, a small portion of each floor was sacrificed and the building carried as high as was necessary to provide the required space.

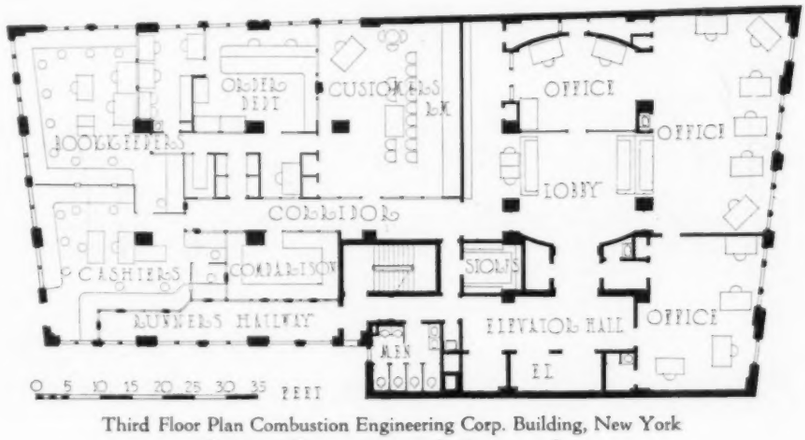
The base of the exterior is faced with limestone and the windows and doors are bronze. Over the doors are bronze plaques bearing the trade mark of the Chicago Pneumatic Tool Company. The shaft is of gray brick with every sixth course on edge, and the two top stories are of gray brick and limestone. Above the ninth story, the face is set back one foot from the property line to conform with the requirements of the zoning law, and to take away the harshness of this appearance the center of the shaft is also set back one foot.

In considering the general interior finish, the owners had two purposes in mind: First, it was desired that every part should be constructed to secure the maximum sanitary efficiency. Second, the offices were to be as attractive and cheerful as considerations of economy would permit. The toilet rooms have tile floors and walls, white marble stalls, electric dryers, and electric automatic urinal flushing devices.

The original intention was to make the floors of concrete and cover them with linoleum. After considering the question of cost, it was found that economy would result from the use of terrazzo floor finish, which lends itself to cleanliness and requires no maintenance expense. As most stock wood and glass partitions are somewhat light in construction and poor in proportion and detail, a substantial and adaptable type of partition was evolved and carefully detailed. This was reasonable in cost and easily erected. The glass is carried down to within 18 inches of the floor and divided by slim muntins, resulting in a partition attractive to the eye and permitting a maximum of light. The plaster at the windows was returned to the frames and marble stools installed. After a careful consideration of the color scheme, the walls and ceilings were finished in oatmeal color and the woodwork was painted olive green.

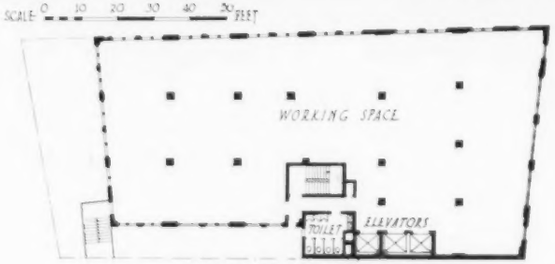
In an attempt to get away from the conventional oak or mahogany executive offices, the rather daring idea of finishing the tenth floor in a gray, just off white, was discussed and finally adopted, with most gratifying results. An ample lobby, with tile floor and Belgian black marble base, is entered on leaving the elevators. All trim is colonial and all walls are treated with muslin. The executive offices and directors' room are wainscoted with birch instead of with the more expensive mahogany or walnut; all woodwork is enameled and the walls and ceilings are painted in the same gray tone throughout.

It was desired to have an attractive though inexpensively finished show room in front on the ground floor and to devote the rear of the floor to the New York district sales office. The floor was finished with buff tile with a black and orange border and black marble base, and high wainscoting and built-in show cases were provided. The detailing is in the Adam style and the lighting fixtures and hardware, finished in silver, are ornamental. The register faces are of cast bronze in an attractive pattern and all radiators are concealed behind either wood wainscoting or black marble. The Chicago Pneumatic Tool Co. building was erected by Dwight P. Robinson & Co.. Inc.

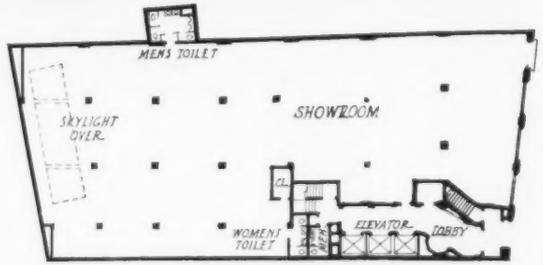


Third Floor Plan Combustion Engineering Corp. Building, New York
Showing office arrangement for brokerage firm

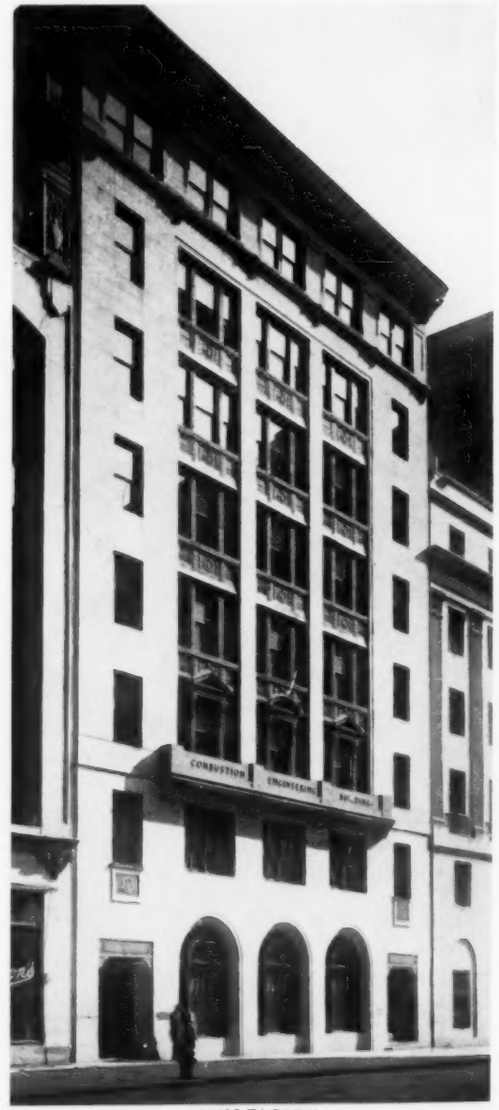
DETAIL OF LOWER STORIES



TYPICAL FLOOR PLAN



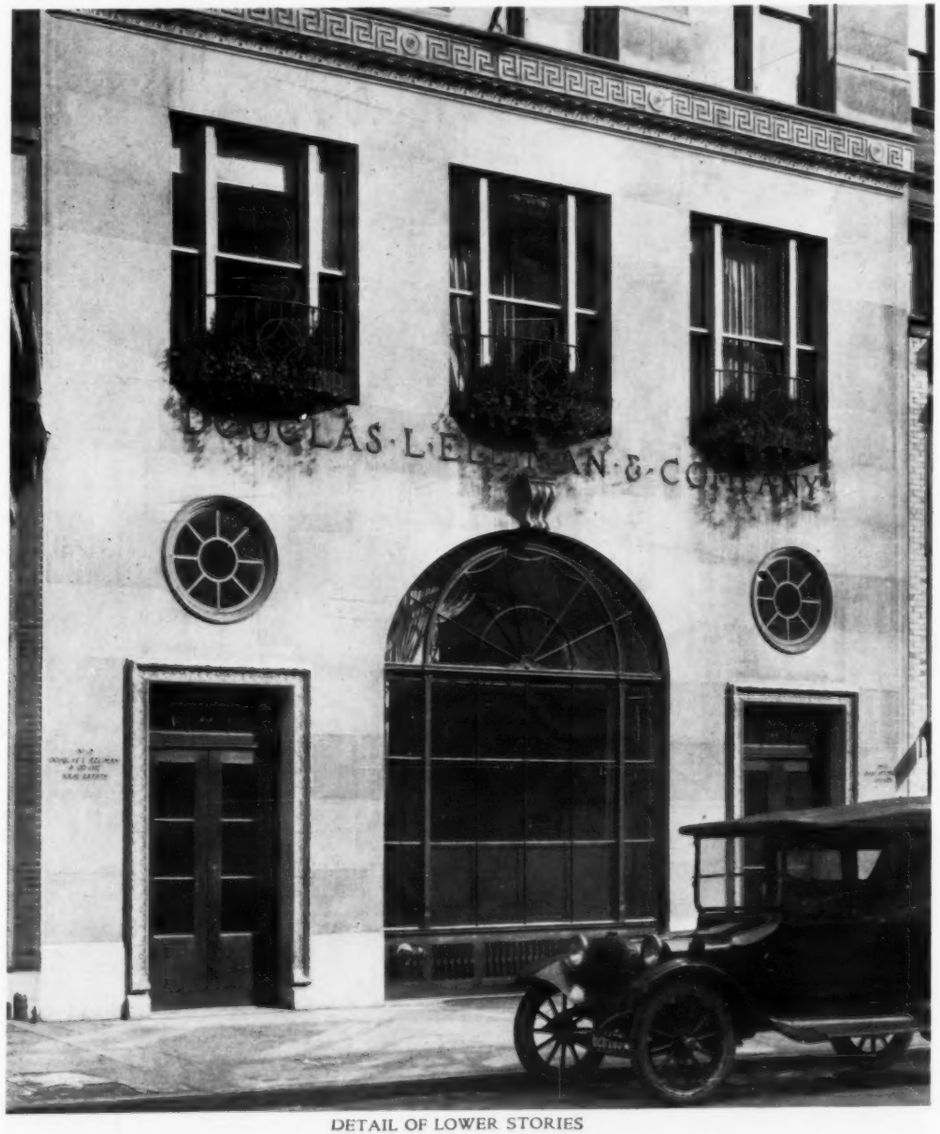
FIRST FLOOR PLAN



MAIN FACADE

COMBUSTION ENGINEERING BUILDING, BROAD STREET, NEW YORK

LUDLOW & PEABODY ARCHITECTS



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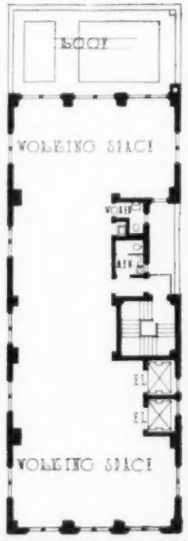
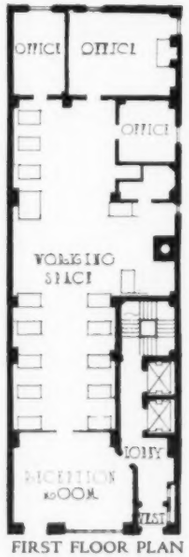
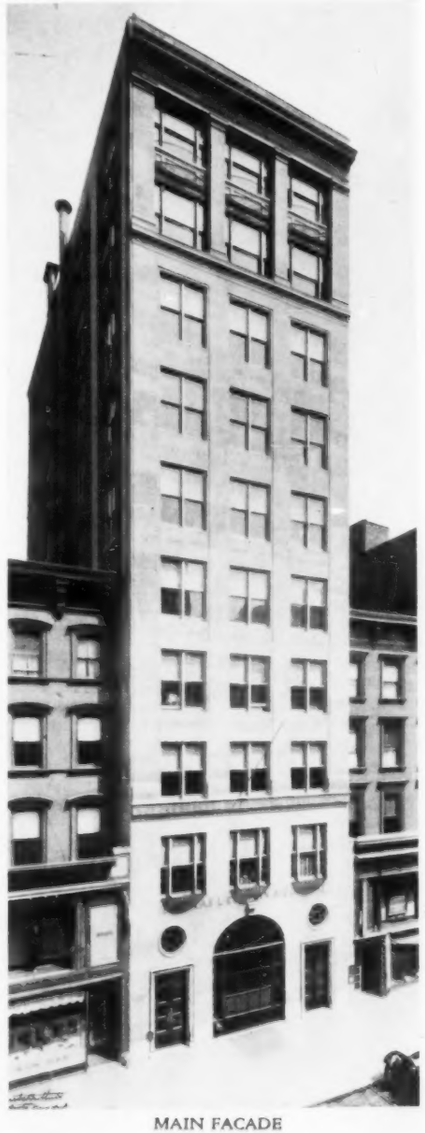


TYPICAL FLOOR PLAN



FIRST FLOOR PLAN



MAIN FACADE

OFFICE BUILDING FOR DOUGLAS L. ELLIMAN & CO., INC., NEW YORK

CROSS & CROSS, ARCHITECTS

An Eighteen-Story Concrete Structure

THE HIDE & LEATHER BUILDING, NEW YORK

THOMPSON & BINGER, INC., ENGINEERS. STARRETT & VAN VLECK, CONSULTING ARCHITECTS

By RAOUL C. GAUTIER, C.E.

ONE of the tallest reinforced concrete buildings in this country, an 18-story all-concrete office and loft building, has been recently completed at the corner of Frankfort and Gold streets, at the Manhattan end of the Brooklyn Bridge, in the heart of that part of New York commonly known as the "swamp." This building, which rises 213 feet above the curb, is known as the Hide & Leather Building, and has been erected for an association of prominent hide and leather manufacturers and merchants desirous of securing for themselves superior office quarters in a district which has few, if any, such quarters to offer. They occupy nine floors of the building, the balance being leased.

A building of structural steel, faced with brick, was originally contemplated, but a concrete alternate having been secured and the price for an all-concrete building being lower than that for a steel frame with brick and stone facing, it was decided to adopt the concrete design. The owners' decision was also influenced by the fact that they wanted the construction of the building to start at once although the plans were in a very indefinite state. A structural steel frame would have required a complete and final design before the order could be placed, whereas the elasticity of the concrete design would permit starting at once and making practically any change required at any time. As a matter of fact, it was not until the 12th floor had been reached that a final decision was secured as to how the 15th and upper floors would be built. Actual work started October 5, after the foundations were completed, and the roof was poured on March 23, six months later with a loss of 15 working days due to winter weather.

The first problem faced by the engineers, and without a doubt the most important in a structure presenting a good many, was that of the foundations. Borings had shown the upper strata to be muck and peat, and the under soil to be sand to a depth of 100 feet. Safety, economy and time were the deciding factors and, after rejecting wood piles, pre-cast concrete piles and moulded-in-place concrete piles, which for various reasons were not thought to be suitable, a method of securing footings was adopted that had particular merit. This consists of three foot sections of thin steel cylinders which are filled with concrete and forced down by means of hydraulic jacks as the building goes up, the necessary reaction being given by the weight of the upper structure itself. When the building is nearing completion and the weight of the building permits of it, the piles are tested to absolute refusal under the desired load, and wedged against the concrete footings (Fig. 1). This system had been used extensively in underpinning work during the construction of the subway, but in a few instances only as foundations for new buildings; it was, however, thought best in this particular case since, besides permitting an immediate start on the construction of the building proper, this means of reaching sub-strata appeared to give the best guarantee of no settlement or, at any rate, of very little. The system proved highly successful since, from the beginning of the operation until the end, the movement did not exceed ¼ inch.

The Hide & Leather Building, New York

With regard to the structural design, the engineers decided to use flat slab construction which would permit a considerable saving in height, and reinforced concrete columns from the top floor to the basement. It has often been said by the opponents of concrete that the enormous sizes of the lower concrete columns in high buildings make the material entirely inadequate except for the construction of buildings not exceeding five or six stories in height. It is interesting to note, in this respect, that in the first story of this building, the interior columns, carrying a load of 1,280,000 pounds, are only 38 inches in diameter. A comparison with steel columns fireproofed would show that the diameter of the concrete columns is not much larger than the diagonal of the rectangular spaces occupied by fireproofed steel columns. It is also worth while noting the

Fig. 1. View of Foundation Showing Hydraulic Jacks Used to Force Piles Down as Building Progressed

fact that had the New York Building Department permitted the use of 1 : 1 : 2 concrete with a stress of 750 pounds per square inch on the concrete and 7,500 pounds per square inch on the vertical steel, the diameter of the column in question could have been reduced to 34 inches, which is only 2 inches larger than that of a steel column with a circular tile fireproofing, and 2 inches smaller than the diagonal of the same steel column with a rectangular tile fireproofing.

As the building was designed so that the floors could be rented for loft purposes, a live load of 120 pounds per square foot was used. Had the usual office floor load been used instead, the diameter of the columns would have been reduced to 34 inches for 1 : 1½ : 3 concrete, and 30 inches for 1 : 1 : 2 concrete. The original intention was to use concrete wall pilasters and 12-inch brick curtain walls with a limestone facing on the lower two stories. However, after careful consideration, 8-inch concrete curtain walls, which are allowed by the Building Code in place of the minimum of 12 inches of brick, were adopted throughout, thereby gaining 4 inches of space all around the building, and giving to the designers a deep spandrel which was used to great advantage to take care of the wind stresses. Thus, following a pet theory of the engineers, who claim that any necessary structural member should be shown, no attempt whatever was made at disguising the walls or columns; they were concrete, and concrete they remained. They were given a fine carborundum rubbing to eradicate the board marks, but no cement wash was applied, every effort being made, on the contrary, to preserve the color and texture of the original concrete.

On the two lower stories of the building, however, where it had been intended to use limestone, it was felt that something different in the way of finish was needed, although it was desired to maintain the monolithic appearance of the building, and, as a means to that end, a special facing, made of white cement with colored aggregate, was *poured* at the same time as the walls and columns. The aggregate in this facing was composed of particles of pink quartz, felspar and green stone. Now that the surface—which was allowed to weather for several months—has been bush hammered and well washed to bring out the colors, the base of the building appears to be carved out of a single piece of granite, thus giving a beautiful effect (Fig. 2).

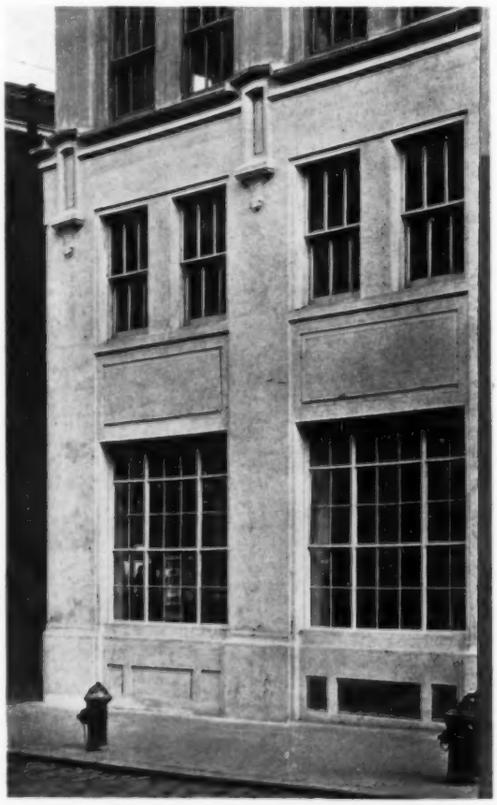


Fig. 2. Portion of Lower Stories Showing Concrete Surface Finish

The method employed in building this facing is believed to be original, and a description of it will undoubtedly prove interesting. The forms for the walls and columns were built as usual and metal lath wired to the vertical reinforcement approximately 2 inches from the face (Fig. 3). The special mixture with colored aggregate was then poured, very dry, into this narrow space and well tamped with a special flat tool; the metal lath was sufficient to retain the mixture and provided a good bond with the plain concrete backing which was poured into the form immediately after the facing was in place, care being taken always to keep the level of the facing 6 or 8 inches above that of the plain concrete to avoid any

of the plain mixture pushing its way through the metal lath into the front finish. It is interesting to note that some of this facing was poured from a height of 12 feet and, notwithstanding its thinness, such care had been taken in the tamping process that very few parts showed any honeycombing, and very little patching was required. The entire exterior surface was treated with a colorless waterproofing, and, although the building has stood some very severe storms, not a drop of water has yet found its way into the interior.

There is very little to be said in connection with the flat slab floors which were designed in accordance with the new city regulations for the two-way system. The design of the upper portion of the building, however, is interesting inasmuch as a considerable portion of the load of the structure above the 15th floor, including a 10,000-gallon tank, is carried directly on the 15th floor slab girders (Fig. 4). This type of construction was adopted at the request of the owners who were desirous of securing unobstructed spaces on the 15th, 16th and 17th floors (Fig. 5). Particular attention is called to the design of the tank and its roof above, as it is somewhat unusual. It was originally planned to use a steel tank, but when the shape of the upper portion was finally determined, it was found expedient to build the tank of concrete and to use its walls to carry a certain portion of the roof load. The horizontal reinforcement of this tank consisted of ½-inch round bars wired to 15/16-inch rib-stiffened metal lath laid vertically, and the concrete was plastered on both sides of the metal lath to a total thickness of 4 inches. Integral waterproofing was used in the mortar and so far, under a 6-foot head of water, no leaks have developed. It may be said that a concrete pan (Fig. 4), connected to the drains, was provided under the tank to take care of any leakage and to prevent any possibility of the water seeping through the concrete into the offices below.

Fig. 3. View from Inside Forms Showing Metal Lath Wired to Reinforcing Rods to Retain Special Facing Mixture

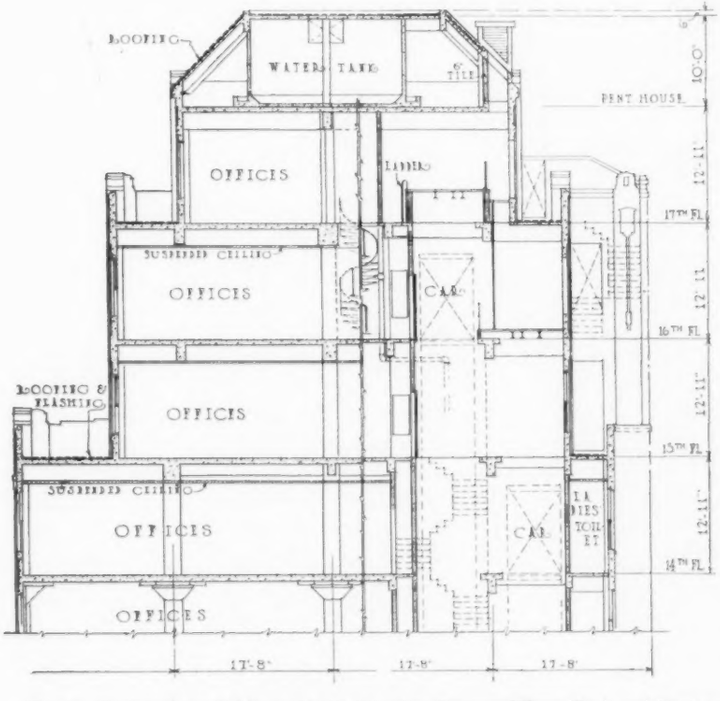


Fig. 4. Section through Upper Stories Showing Concrete Water Tank and Portion of Load Carried on 15th Floor Slab

The stack was originally designed in concrete, but it was found more convenient to build it of brick except in that portion showing above the 16th floor where the original design was followed. This chimney was made strong enough to resist any wind stresses by itself, the arched brace connecting it to the building (Fig. 6) being added for appearance only. As a matter of fact, this brace was built independently of the chimney so as to allow for expansion of the latter. The stairs throughout the building were entirely constructed in concrete; they do not present any particular feature except possibly their height.

Three inches of integrally waterproofed concrete were plastered over the reinforcement of the roof slabs, but as the slab was found to be not entirely waterproof against driving rains, an additional inch of waterproof concrete was

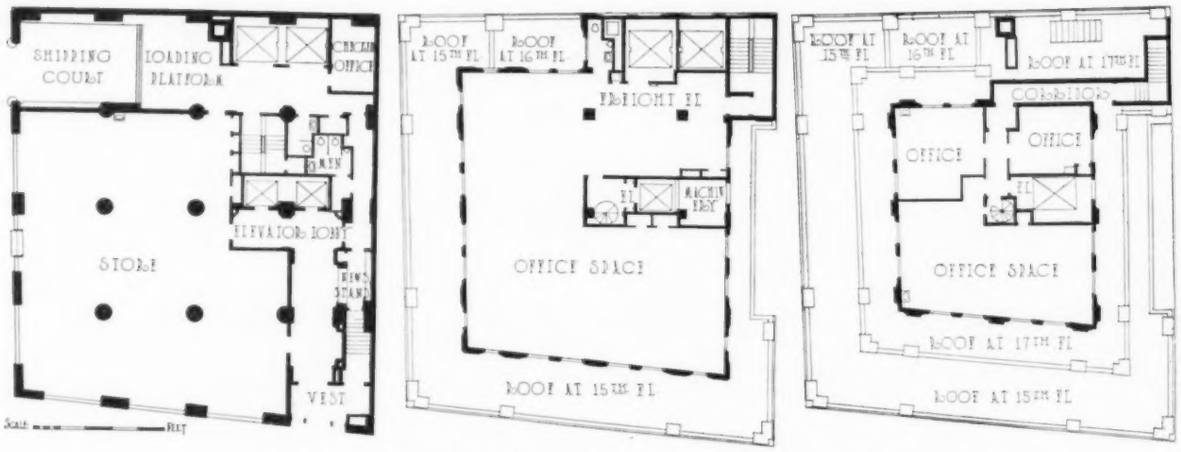


Fig. 5. First, Sixteenth and Seventeenth Floor Plans, Hide & Leather Building

plastered on the under side with complete success. Metal forms were used for the flat slab and depressed panels, with the result that fine and smooth ceilings, requiring little finish, were obtained. All the interior surfaces were rubbed, where necessary, with an electric grinding machine. The ceilings were left smooth and painted with two coats of hot water calcimine. As for the other ground surfaces, they were given a very thin sand floated finish, and painted. No concrete was plastered. Later on, when interior partitions were installed, they were plastered and also finished with a sand finish, and the textures are so similar that one can hardly tell the difference between the two materials used.

On account of the cold weather and the speed of the construction, five slabs were kept shored during the construction, two slabs being fully shored and three having only about half the shores originally required. Each slab was therefore shored for a period of approximately 30 days, and, to keep a check on the hardening of the concrete, a novel method was devised. At the time that the concrete was poured, 12 cylinders made of sheet metal were pressed into the concrete. They had first been placed within pieces of mailing tubes so that no difficulty was experienced in taking them out of the slab when needed, since the cardboard, rotting very quickly, permitted them to slip out easily. After the concrete had been in place for 7, 14, 21 and 28 days, respectively, three cylinders were taken out and immediately tested. In practically every instance the concrete reached a strength of 1,600 pounds per square inch at 28 days; it was therefore quite safe to remove the shores.

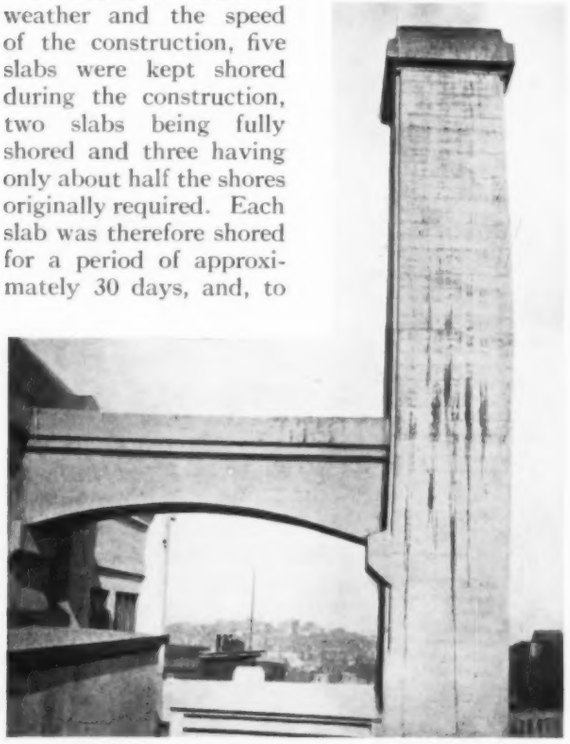


Fig. 6. Upper Part of Stack in Concrete with Independent Brace to Allow for Expansion of Stack

This figure of 1,600 pounds per square inch may appear high when one takes the winter weather into consideration. However, great care was taken to heat the materials even when the temperature was not actually below freezing point, and, when the temperature was below 40° Fahr., salamanders were kept going under the freshly poured slabs for 24 hours—the metal forms transmitting the heat to the concrete much better than wood forms. Furthermore, a slump of between 7 and 8 inches was specified and a rigid inspection was made several times a day from the office to make sure that the specification was followed. It is believed that the quality of the concrete was in great part due to this precaution.

In concrete buildings it is usual for the elevator contractor to wait until the shafts are completed to take the necessary measurements to order the cars, this being often the cause of delay. In this building, as it was necessary to have elevators running at the earliest possible moment, the dimensions and verticality of the shafts were guaranteed to the elevator contractor. A great deal of care had to be taken in the construction of these shafts, but they finally turned out very successfully. Inserts for the guides were placed in the concrete at the time of pouring, the elevator contractor following up the work so closely that two elevators, out of four, were in operation one month before the building was completed which facilitated finishing details.

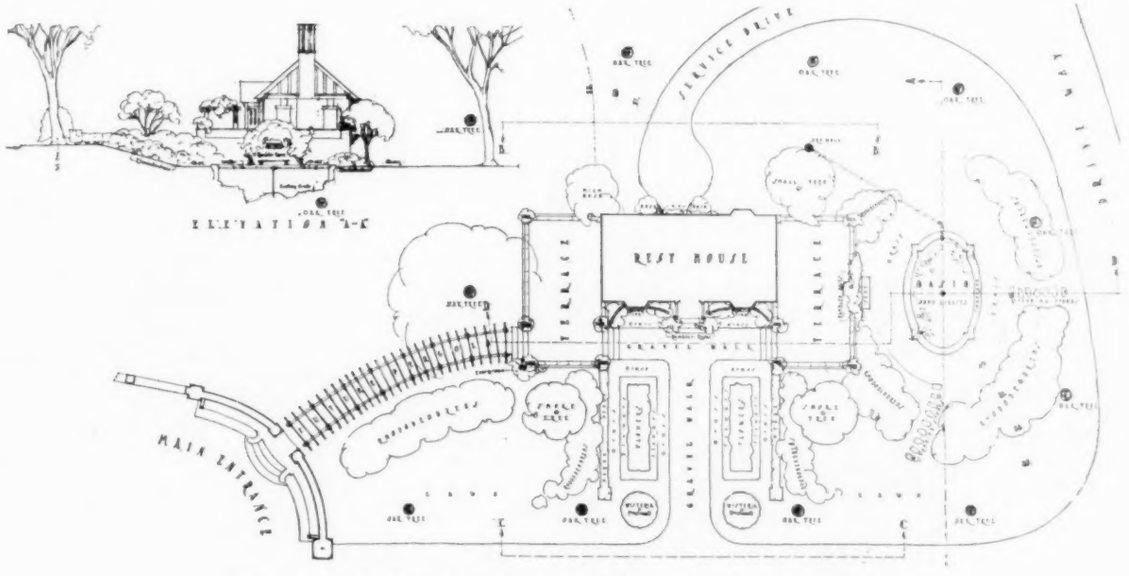
A Small Brick Building of Elizabethan Character

THE REST HOUSE AT MT. AUBURN CEMETERY, CAMBRIDGE, MASS.

RALPH HARRINGTON DOANE, ARCHITECT

IT occasionally happens that to the designing of the smallest and simplest building an architect finds opportunity to give that detailed study and research which we more regularly associate with monumental work. It is true, too, that to design a good small building requires more intensive study proportionately than is involved in designing a large structure. In a small building we are intimately associated with all the detail, and the scale and character of ornament must very nearly approach perfection for the building to receive unqualified approval. It is, however, the exceptional instance when circumstances favorable to detailed study surround the designing of the small building.

The planning of the Rest House at Mt. Auburn Cemetery, Cambridge, may justly be considered one of these exceptional instances. The cemetery is an old one with many historical associations and with a large area of undeveloped land. In studying the development of this plot it seemed desirable to arrange for a new entrance from a boulevard skirting the Charles River at this point, because of traffic difficulties involved in using the present entrance leading from an important thoroughfare. This little building is a part of the new entrance scheme. It lies to the left of the driveway and is planned to provide an attractive resting place for those waiting for funeral services and for visitors to the cemetery. The site, which slopes away from the road in bowl fashion, has determined the placing of the building

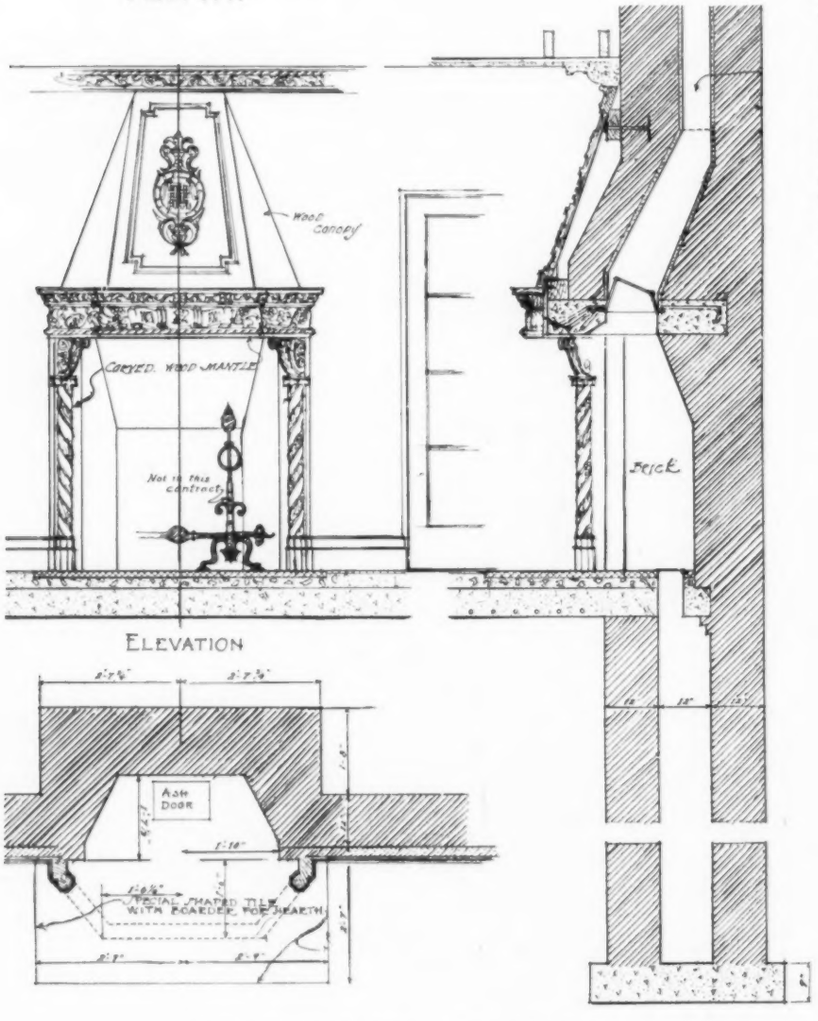


Plot and Planting Plan of Rest House, Mt. Auburn Cemetery, Cambridge, Mass.

and its surrounding garden development. The space in front is leveled to the grade of the roadway and wide terraces are arranged at each end. A curved and flower bordered walk with pergola shelter leads from the gate to the left terrace, and a service road is at the rear and below. The right terrace overlooks a sunken garden which is so planned that the natural grades are used to excellent advantage. The lowest point is used for a formal pool.

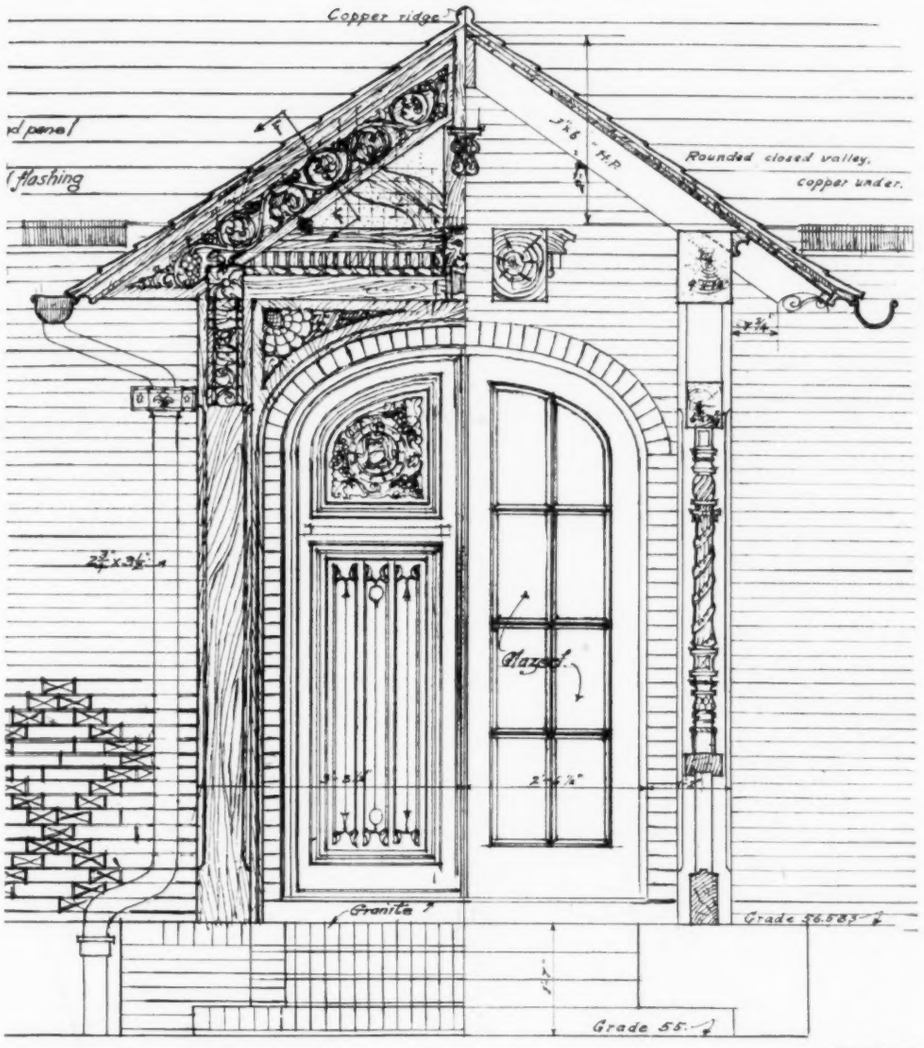
The building itself is designed with sixteenth century English precedent in mind and is particularly rich in the detail of its woodwork. The porch, oriel windows, verge boards and rafter ends show careful architectural design and good, vigorous craftsmanship in the carving. The wood is oak and has been bleached with a lime wash which gives it a pleasing lightly weathered tone. The walls are laid in Flemish bond, of New England water-struck brick of a light red tone, and a diamond pattern, well scaled with the building, is carried out with overburned headers, varying from blue to a greenish black color. Interesting brick detail is seen in the terrace balustrades. The interior is simply planned with an office and a public sitting room as the main features. The walls are of rough gray plaster with simple cast plaster cornices in conventionalized leaf forms in Gothic design. The floors are paved with tile and the interior trim is kept to the minimum, which affords excellent contrast between the paneled doors and carved oak chimney-piece in the principal room. The roof is covered with graduated and vari-colored slate, but special care has been taken to avoid undue exaggeration of roof texture with the attendant danger of destroying scale. Gutters, leaders and leader heads are copper.

In preparing the drawings the architect gave the greatest attention to his original small scaled studies. Here proportions and scale were carefully established and it became simply a matter of adhering to them in the finished drawings. Details of carving and turned woodwork were worked up in large scaled and full size drawings in soft pencil and crayon; from these the models for final approval were made. An interesting detail of the landscape work is the fact that consideration of this was likewise given in the sketch studies. The size and general character o. planting were indicated in elevation and plan, and these were later transferred to final landscape draw-



Detail of Carved Wood Chimney Piece in Waiting Room

Cartouche on Mantel Canopy

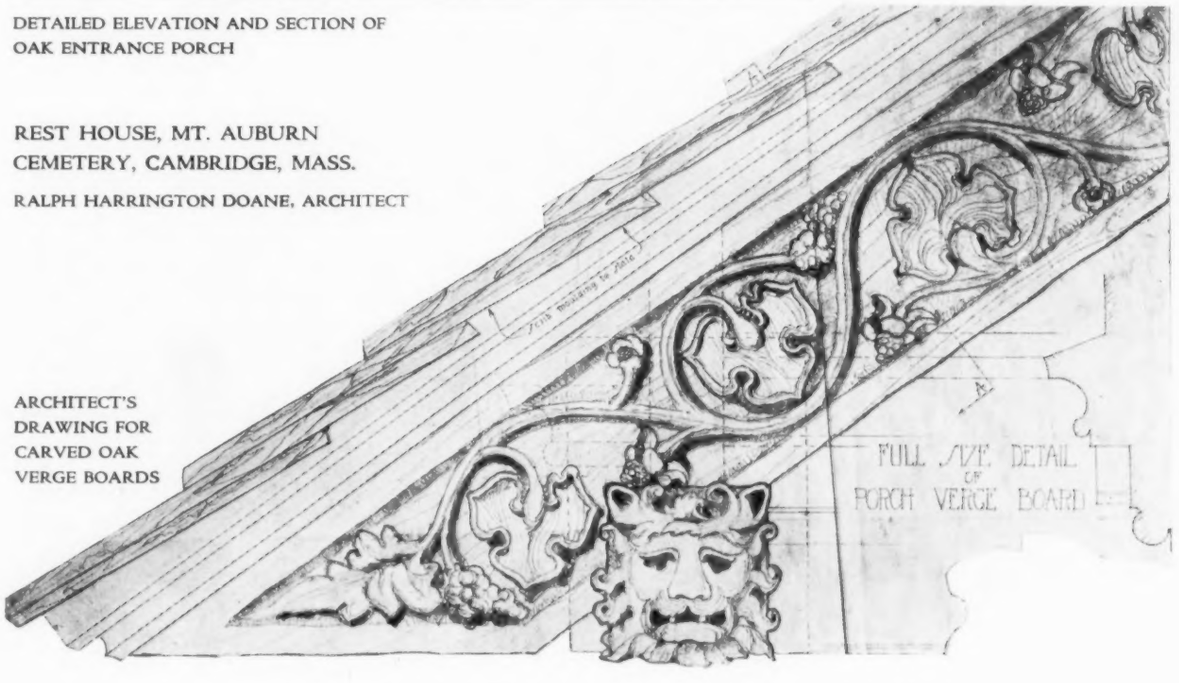


DETAILED ELEVATION AND SECTION OF OAK ENTRANCE PORCH

DETAIL OF BALUSTERS ON PORCH

REST HOUSE, MT. AUBURN CEMETERY, CAMBRIDGE, MASS.

RALPH HARRINGTON DOANE, ARCHITECT



ARCHITECT'S DRAWING FOR CARVED OAK VERGE BOARDS

ings. From the large supply of shrubs and trees owned by the cemetery, specimens were selected of the sizes and shapes indicated and the finished result shows a close resemblance to the studies.

The building was completed in the late fall of 1921 and the photographs from which our illustrations are reproduced were made just at the end of the season. They therefore do not portray the added charm that will come naturally to the building and its garden treatment with the growth of a season or two. The type of architecture is one, too, that greatly increases in interest with age. The architect has, however, been especially successful in imparting to a newly finished building the charm that sketch studies frequently display but which is rarely a part of the completed work, owing to the myriad steps that must be taken between the conception of a scheme and its final completion.

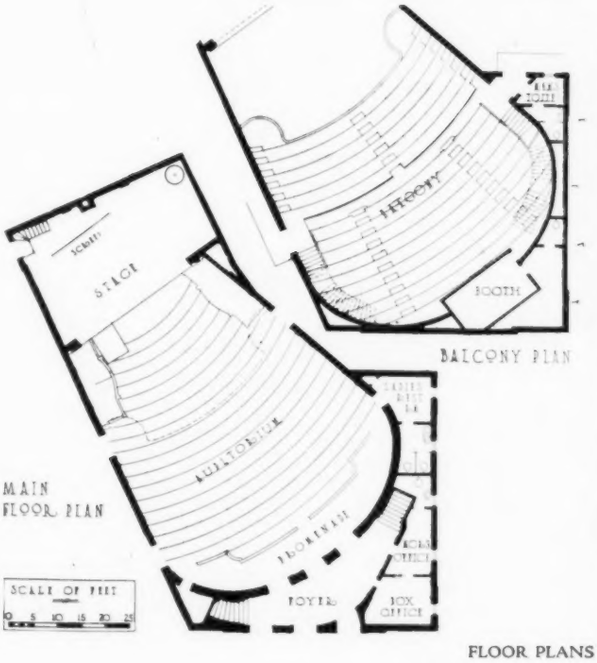
Detail of Porch, Rest House, Mt. Auburn Cemetery, Cambridge, Mass.
Ralph Harrington Doane, Architect

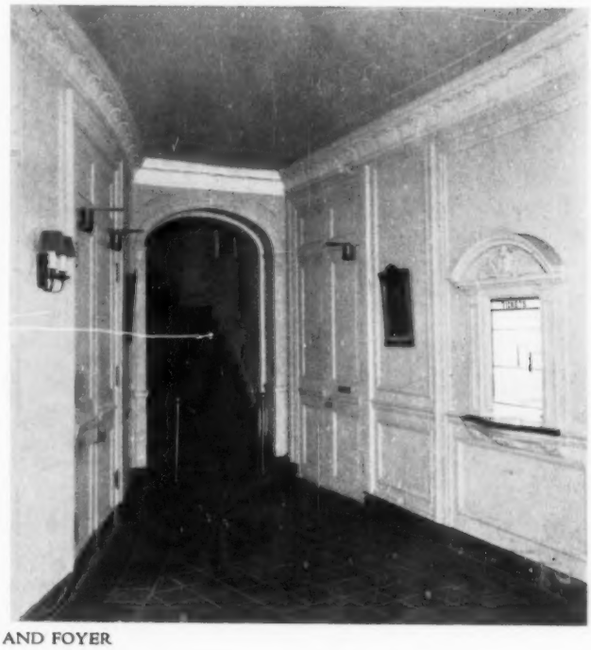
GENERAL VIEW

REST HOUSE, MT. AUBURN CEMETERY, CAMBRIDGE, MASS.

RALPH HARRINGTON DOANE, ARCHITECT

MAIN FACADE





FLOOR PLANS AND FOYER

CIRCLE THEATER, ANNAPOLIS, MD.

HENRY P. HOPKINS, ARCHITECT

ENTRANCE FRONT

FLOOR PLANS AND VIEW FROM ROAD

"OVERLOOK COTTAGE," FOR E. CLARENCE JONES, ESQ., SARATOGA SPRINGS, N. Y.

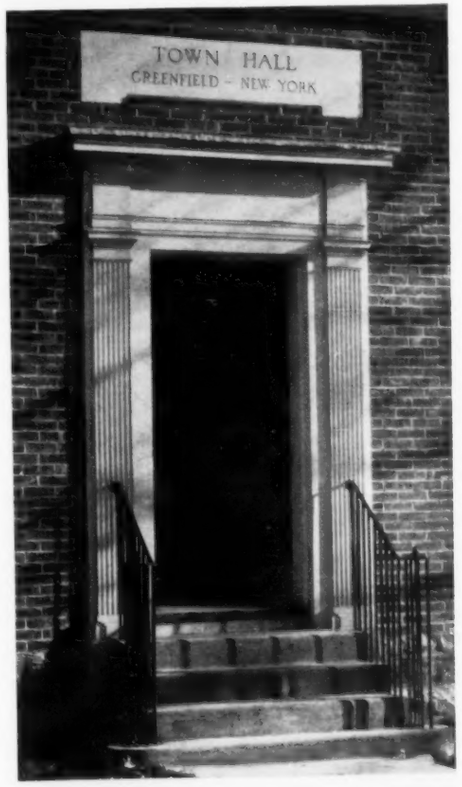
LEWIS E. WELSH, ARCHITECT

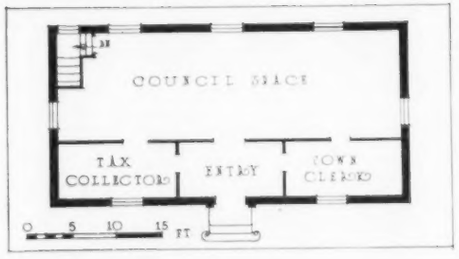
MAIN FRONT

VIEW OF END AND REAR

"PINE TREE COTTAGE," FOR E. CLARENCE JONES, ESQ., SARATOGA SPRINGS, N. Y.

LEWIS E. WELSH, ARCHITECT





DETAIL AND GENERAL VIEW

TOWN HALL, GREENFIELD, N. Y.

LEWIS E. WELSH, ARCHITECT

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Electrical Wiring Layouts for Modern Buildings

PART III

By NELSON C. ROSS, *Associate Member, A.I.E.E.*

IN the laying out of the plans and specifications, and with the necessary information at hand, the construction of the building must be outlined.

First Class Construction. If the projected building is of first class construction, we are compelled to use a full conduit system, conduits being used for all wiring circuits, whether these wires control power, lighting or telephone and other low tension equipment. The outlets must all be of steel or iron and of the standard type in use for conduit work, the circuit wires looping from the outlets back to the panel boards, and the system of conduits and wires controlling from each panel board being complete in itself, the panels being connected either singly or in groups on the riser and feeder mains, which in turn are run back to and controlled from the main distributing switchboard.

The low tension circuits, including telephone, bell, clock, A.D.T., fire alarm and other signal wires, are carried back in conduits to distributing cabinets, and the master circuits are run from these cabinets to the general center of distribution for low tension wires. The conduits of each low tension system should be separate from all others, so that there will be no interference between the wires of the different circuits. This method of distribution of the wiring circuits and control would be practically the same for any type of building; the methods of feeding the distributing switchboard from the service, or the methods of connecting the low tension circuits with the entering service lines, will depend upon the type of building and the load. These methods will be considered later.

Second Class Construction. If the building is of second class construction and will warrant the expense, it is still advisable to consider the installation of a full conduit system of wiring, the outlets and materials being of exactly the types already noted. If, however, it is found necessary to reduce the expense of the electrical installation, conduits may be run for the installation of all large feeders and mains, and for runouts to motors. Again, conduits must be used in all damp places and where it becomes necessary to build the circuits in brick or masonry walls. In partitions of wood studding, however, and between wooden floor timbers, B.X. armored wires may be used at a considerable saving over the use of "all conduit." At points where the conduit circuits terminate and are continued in B.X. wire, it is necessary to provide junction boxes, excepting at panel board locations, as B.X. construction may be continuous from the panel boards to the outlets.

A further reduction in expense can be effected by the running of low tension bell wires in the stud partitions without protection of any kind, simply clipping the wires to the timbers. This form of construction, however, should be avoided wherever possible, as in the event of trouble on the circuits it is necessary either to abandon the circuits and run new wires, or to cut through walls and floors to find the source of the trouble. In buildings of this type, where it is impracticable to use rigid conduit, due to building conditions, flexible steel conduits may be run. This, however, is more expensive than rigid pipe, and is seldom used on new work excepting in difficult places.

Frame Buildings. Rules permitting, frame buildings may be wired with conduits, armored wires or knob and tube construction; conduit work is to be preferred, still B.X. gives a thoroughly satisfactory installation, as the wires may be secured in all ways to the timbers during the construction of the building, and with new work it is possible to set outlet boxes in a thorough and rigid manner before the lathing is begun.

On small buildings the panel board is generally located in the basement and branch circuits only carried above the basement floor (Figs. 1 and 2). Where possible, however, conduits or armored conduits should be run for the installation of bell, telephone and signal wires. Where knob and tube construction is used, careful inspection should be made during construction to insure an adequate number of knobs installed to support the wires properly, and also to insure a knob set on each wire at a point near the fixture outlet, with a length of circular loom reaching from the knob to a point well within the fixture canopy.

Porcelain tubes should protect the wires at all points where these wires pass through studding, timbers or wood of any kind, and porcelain tubes should be slipped on the wire and securely taped thereto at points where the wires may come in contact with metal or masonry. At points where wires rise through the floors there should be tubes through the wood and other tubes strung on the wire so that falling plaster will not come in contact with the

wires at the points where they pass through the floors. Cutouts as a rule are of the porcelain type; these should be installed in a steel, or metal lined cabinet, and all wires entering the box should be protected with circular loom tubing.

Old Buildings. Unless being dismantled, old buildings should be wired either with B.X. armored wire or conduits. Of the two, B.X. will be cheaper and more easily installed. The locations of the panel boxes would be the same as for other types of construction, excepting that in old buildings it is advisable to install the panel boxes in locations where the wires may be readily carried to them. On large buildings it is sometimes necessary to run the riser and feed wires exposed, B.X. only being run for the branch circuits. Where signal or telephone wires are required, they may be fished through the construction, or may be installed in flexible steel conduit or in circular loom tubing. With B.X. construction in old buildings, the panel boards may be of the standard type and installed in steel boxes, or again steel boxes may be used with porcelain cutouts.

In old buildings which are already wired, and where it is desired to install new outlets, feeding them from existing outlets, it is common practice to use metal mouldings for the runouts, and special fittings can be obtained which fit over the existing outlets, permitting runouts to be made in any direction.

Exposed Work. In buildings of mill construction, or where exposed work must be considered, the wires may be run on cleat construction, in conduits, in metal mouldings or in wood mouldings. It is not advisable to use B.X. armored wire for exposed work unless the appearance of the wires is of no consideration, as it is impossible to install B.X. in straight lines or to use square turns, and in spite of the care with which the work is carried out, the wires are unsightly.

Rigid conduits, using the special outlets which are available, make a very satisfactory installation, and, aside from appearance, have all the advantage of concealed conduit work. Panels and cutout cabinets as well as fittings should be of the surface type and care should be exercised in the running of the conduits to insure a workmanlike appearance. Metal moulding, when properly installed, is less unsightly than exposed conduits. A complete line of steel fittings is made to be used with it. It can be broken around beams and fitted in corners more readily than conduit; again, this system is less expensive to install than exposed conduits. With this system it is customary to run all mains and feeder wires in conduits (Figs. 1 and 2).

Cleat construction is less expensive than any other type of electrical wiring, and it is fairly safe when properly installed. As the wires have no protection from mechanical injury, this type of construction should not be considered where it is possible to install some form of steel.

Residence Wiring; New Buildings. The work involved in laying out a wiring system for a residence is small compared with that required for a building of the school or commercial type, nevertheless, no building requires more careful consideration and study, as to the locations of the outlets, the types of lighting fixtures to be used, and the methods and convenience of switch control.

The description given here refers to residence building in general, and may be applied to a cottage of 6 or 7 rooms or to a building of many rooms and several floors. The number of outlets to be used in each room, convenience of switch control, the use of elevators, refrigerating equipment, electric cooking, etc., in fact the completeness of the electrical layout, must be determined for each particular installation. The general methods of installation, the manner of connecting outlets, placing of panels and switchboards, and the installation of the service, however, will apply to all residence buildings irrespective of their sizes.

Before beginning work on the layout, the building plans should be carefully considered, and if possible

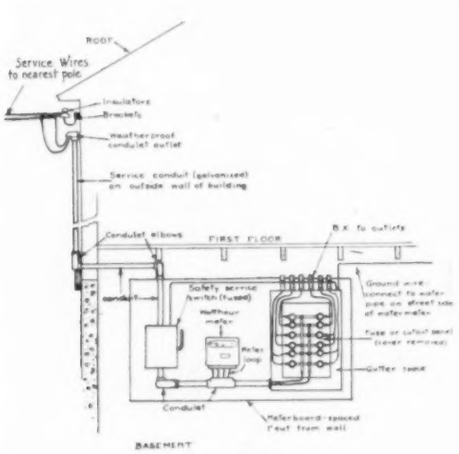


Fig. 1

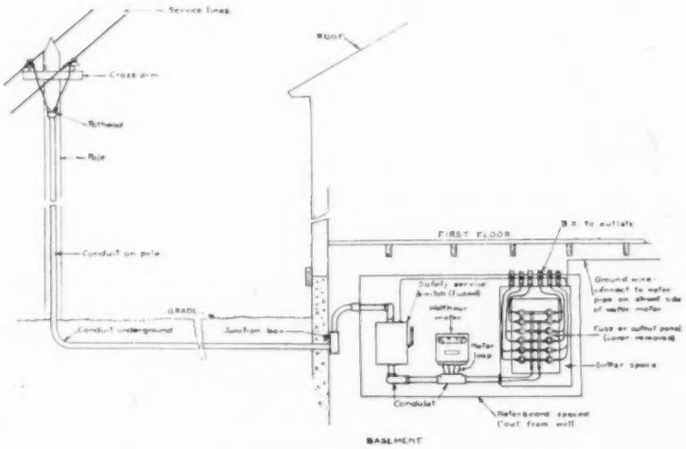


Fig. 2

Diagrams of Meter Board, Service Switch, Panel Board, etc., for Overhead and Underground Service

the furniture layout secured, so that the outlets may be located with reference to the positions of the furniture. Furthermore, provision should be made in the contract permitting the exact locations of the outlets to be checked before actually installed, as the exact locations may have to be determined at the time of installation. Information must be obtained from the service company as to the location of the service switch and meter board, the point where the service wires will enter the building, and also whether the service will be two-wire or three-wire.

System of Wiring. If the building is of first class construction, all circuits must be run in rigid conduits. If of second class construction, the mains and feeder circuits may be run in conduits, while all branch circuits may be run with B.X. armored wires. If of third class, or frame construction, a combination conduit and B.X. system may be used, or, if it is desired to keep the first cost of the installation at the lowest point, a combination conduit and knob and tube system may be adopted.

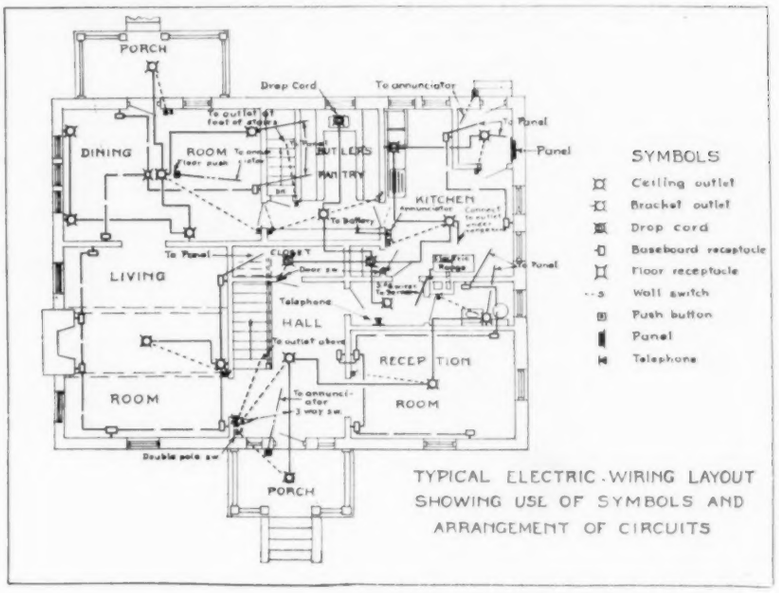


Fig. 3
Symbols and Circuit Arrangements on Typical Wiring Layout

On any combination system it is advisable to run all feeders and mains in conduits or in flexible steel tubing, and to run the branch circuits only on knob and tube construction. It may be said that with the use of B.X. armored wire for branch circuits, far less cutting of timbers and studding is required than is necessary with the use of rigid conduits. The locations of outlets, switches, panel boards and all other fittings will be the same, regardless of the type of wiring system selected.

Drawings. On the smaller buildings, it has sometimes been the custom to merely spot the locations of outlets and switches on the building plans and to leave the question of circuiting and control to the contractors estimating upon the work and to the wiremen making the installation. This is not good practice even on the smaller buildings, as contractors estimating to "get the work" will figure on the cheapest possible methods of construction and on the cheapest materials and fittings, and furthermore, will make no provision for possible additions to the wiring system. The prices received from contractors will depend on each man's ideas as to what should be installed and as a rule, on work laid out in this way, many extras are found necessary before the work is completed. Accurate drawings showing the locations of conduits and fittings, etc., are not required, yet the accurate locations of all outlets, switches and special equipment should be shown on the building plans. The panel boards and cutouts, service switches and meter boards should be located on the drawings, and all wires should be properly sized (Fig. 3). Switch loops should be connected up, showing the outlets controlled by the switches, and where there are three or more wires required between any two outlets, the number of wires should be indicated. All main and feeder wires from the service switches to the panel boards should be shown on the drawings. On large work it is advisable to make a riser diagram showing all panel boards, motors and special equipment, together with the connecting network of main and feeder circuits.

The locations of concealed conduits or of armored wires cannot well be determined on the drawings, as structural conditions will more or less determine the exact locations of these conduits. The outlets and switches should be accurately located as well as the outlets that are to be connected to each branch circuit. The method of running the wires and the locations of the conduits in the building construction may be left to the judgment of the men installing the work.

Locations of Outlets and Circuit Connections

In locating lighting outlets, each room should be considered separately and the outlets set with reference to the positions of the furniture, trim, paneling, etc. If a furniture layout is not available, it is best to assume locations for the furniture in each room, to show the outlets, and to make provision so that the locations of these outlets may be changed if necessary at the time of installation. After the outlets and switches are determined, the circuits connecting these outlets should be drawn in, and the branch circuit shown from the feeding outlet to the panel board or cutout.

The outlets are noted by means of "symbols" (Fig. 3). Standard symbols have been devised and should be used on all electrical drawings so

that the plans may be read without the necessity of referring to a key. Ceiling and bracket fixtures may be used for the lighting of the rooms in conjunction with wall and floor receptacles, permitting the use of portable lamps.

As a rule, bed rooms of average sizes are best lighted by means of brackets. In a small room, where but one light is to be used, the fixture should be at the left of mirror and 6 ft. 6 ins. above the floor. Where two lights are to be used, one should be at the mirror and one at the left of the bed, or if preferred, the second fixture may be located over a table or desk. Where bed rooms are large or where best results are required, there should be one bracket fixture at each side of the mirror, one at desk or dressing table, and either a bracket at the bed or a receptacle permitting the use of a portable lamp.

The use of reflecting electric heaters is becoming more common, for tempering the air of bed rooms, or for use in the fall and spring when the main heating system is not in operation. It is therefore advisable to consider the use of a heater receptacle in each bed room, controlled from a single circuit from the panel board. This receptacle will not only provide for the heater, but may be used to operate a fan or any portable equipment. Switches are not, as a rule, installed to control the lighting fixtures in bed rooms, as the lights are controlled directly from the sockets; expense permitting, however, a switch should be installed at the door.

Corridors, stair halls, toilets, etc., may be lighted either from ceiling or bracket fixtures, depending upon choice. A bath room should have two brackets one on each side of the mirror, and should also have one receptacle permitting the use of portable equipment. Each bath room or toilet should have a switch at the door, this switch controlling all outlets. Switches controlling corridor lights should be located near the stairs; if the corridors are long and there are two or more entrances, it may be advisable to use three-way or four-way switch combinations, permitting the lights to be controlled from two or more points. Three-way and four-way switch combinations should be used for the lighting of the stairs, the switches installed on the different floors and the stair circuits being separate from the circuits controlling the corridors. There should be a receptacle in each corridor for use with a portable vacuum sweeper, these connected on one circuit and controlled from the panel board.

Dining rooms, living rooms, music rooms, libraries, billiard rooms, etc., are best lighted by means of one or more ceiling fixtures, balanced with a number of wall brackets. Wall receptacles and floor receptacles should also be carefully located in these rooms to provide for the placing of portable fixtures at pianos, phonographs, at tables, book cases, sideboards, desks, buffets, etc. It is advisable also to consider the use of proper receptacles in all these rooms so that electric heaters may be used.

The kitchen is best lighted by means of bracket fixtures; if ceiling pendants are desired, they should be carefully located. The old practice of placing a single pendant, either gas or electric, in the center of the room is to be condemned, as anyone working at the range, table or sink must stand directly in the line of the light. It is well to use a single light at the table and, if the range is not under a hood, to use a ceiling pendant or a bracket at a convenient point. If a hood is used over the range the lamp outlet should be under the hood. If the sink is in the kitchen, a bracket or pendant should be located at or near it. The lighting in the kitchen may be controlled from the sockets or from a switch controlling all outlets. The pantry is best lighted from a ceiling collar, this controlled by a switch.

A ceiling outlet switch, controlled, should be used in the rear vestibule if the refrigerator is located there. A receptacle near the refrigerator permitting the use of a portable cord is also desirable. It is well also to provide an additional receptacle in the event of the use of an electric refrigerator.

If the building is to have a separate laundry, provision must be made for the use of electric laundry equipment; this will include an outlet for motor-driven washer (2 h.p.), a motor-driven extractor (2 h.p.), an electric ironer (1 h.p. motor and approximately 30-ampere load for the heating element), also a number of electric irons. If a separate laundry is not considered, then some provision should be made in the kitchen for the use of an electric iron and a portable washing machine; one receptacle outlet, fed from two No. 14 wires from the panel board will be sufficient. The receptacle, however, should be one of the standard type for this service and should be equipped with a switch and pilot lamp.

In the grouping and connecting up of the outlets not more than 660 watts should be allowed for each branch circuit, and not more than 12 outlets in any event should be connected to a single branch circuit, and this only when it is assured that the fixtures will not require more than 50 watts each.

It is obvious that if the fixtures connected to the outlet are to be used with three 50-watt lamps each fixture will require 150 watts, and not more than four of these outlets should be connected to the circuit, or, if single pendants, each fitted with one 100-watt lamp, are to be used, then not more than six outlets should be connected to the circuit. Where large fixtures, flatirons, electric heating devices, etc., are to be used, there should be a separate circuit run from the outlet to the panel board or cutout controlling these units.

On average residence work, however, it is good practice to allow from eight to ten lighting outlets to the circuit (this does not include switches) as this number will allow more or less leeway in the choosing of fixtures, without the danger of overloading the circuits.

Some Facts on Warm Air Heating

PART I

By L. A. BRISSETTE

HEALTH, comfort, economy of operation, ease of management and durability are the essential features desired in any heating system. There are many modifications of the four principal systems of heating,—warm air, steam, vapor and hot water, and many of them meet these requirements in part, but a good warm air furnace installation embodies all of these features.

A warm air system heats a house by means of fresh air drawn continually, from outside or within, into the heating system in the cellar. This air is heated quickly and driven up and through the house, and an automatic circulation of air continues as long as there is a fire in the heater. This circulation is constant and cannot stop, because it is based on the positive and natural law that cold air descends and warm air rises. Ventilation is of prime importance, and the warm air system guarantees an adequate supply of fresh air.

Many people believe that fireplaces or open grates provide sufficient ventilation. These cannot be depended upon for ventilation excepting for the rooms in which they are placed, because there will probably be no real ventilation unless there are fires in the fireplaces or grates, and also because the amount of air removed from the rooms is seldom correctly proportioned to the sizes of the rooms. The proper and adequate ventilation of homes is more important to health than the heating. The laws of the various states cover carefully the problem of ventilation in connection with the heating installations in schools, churches, theaters and public halls. In most states ventilation must be provided to the extent of supplying 30 cubic feet of air per minute per occupant. If it is necessary that public buildings, where the occupants remain for only a few hours at a time, should be thoroughly ventilated, it is much more important that residences should have adequate provision for health protection.

The value of moisture in the air is not given due consideration by the layman. A certain percentage of moisture in the air is essential for both plant and animal life. It is not unusual to find houses heated by direct radiation, where the percentage of moisture in the air is less than in the driest part of the Sahara Desert. Sometimes the wood in the finish and furniture will shrink and come apart. This is because the air in the room is drier than the kiln in which the lumber used in the finish and furniture was dried. Some people believe that the moisture from the water or steam in the radiator finds its way into the room. This is not so, because the radiators are constructed to hold the water or steam and there are no means provided for the moisture to escape.

Modern high grade warm air furnaces are equipped with water pans of generous proportions. These water pans are placed where the evaporation is greatest. The evaporation is governed by the amount of fire in the furnace. When there is a hot fire the evaporation is greater, causing an even distribution of moisture throughout the house. Some furnaces have a device which automatically keeps the water pan filled with water. This attachment, which is connected direct to the water supply, insures a constant and healthful degree of humidity.

During the heating season the air in the average house, which has no humidifying device, varies from 15 to 25 per cent relative humidity. All medical and scientific experts are agreed that the indoor relative humidity should never be permitted to fall below 40 per cent, and they are further agreed that atmosphere with a relative humidity of 55 to 65 per cent is best. Properly humidified air affords comfort at 65° Fahr., whereas dry air, owing to the excessive evaporation from the skin, thereby lowering the temperature of the body, must be heated to 72° to provide sufficient warmth. This difference of 7° represents a vast difference in the amount of coal burned during a heating season. In residences,

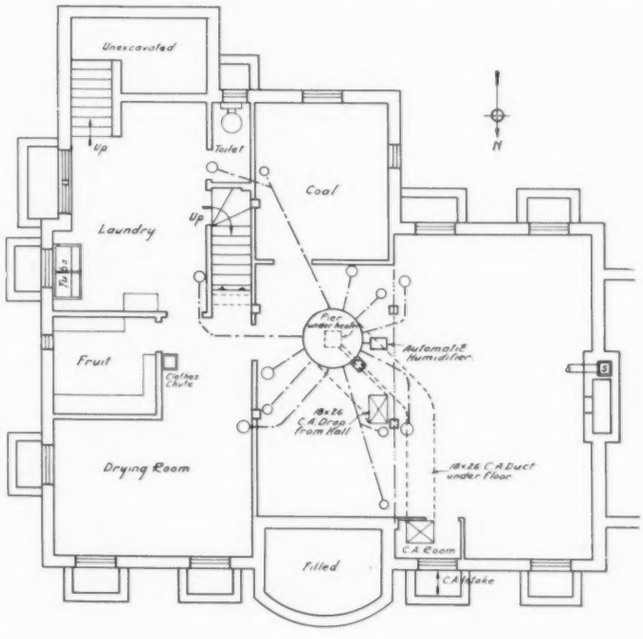


Fig. I

Typical Basement Plan Showing Pipe Runs

large, medium or small, the air can best be properly humidified with the minimum of expense and trouble when a warm air system of heating is installed.

The most common criticism of the warm air furnace system has been the complaint of dust and gas leakage and also the difficulty of heating certain rooms under certain wind conditions. There is no question but that if the furnace be properly constructed and properly cared for, as would be done in the case of any other mechanical appliance, the leakage of dust and gas will be found actually to be no greater than with any other type of heating system. Furnaces are constructed in a variety of ways, but that furnace which presents the smallest number of joints between the combustion chamber and the air chamber is obviously the higher type of furnace and is less apt to cause difficulty. If all of the joints are properly filled in setting up the furnace, and this is one of the things which the architect should superintend with care, there will be no connection between the fire box and the heat chamber. One must realize that gas will come out of the fire box door, due to back draft or natural "chimneys" through the house, and in this way escape from the basement to the various rooms through the spaces around the pipes, etc. This undoubtedly is far more frequently encountered than a leakage of gas directly from the fire pot into the chamber. The dust follows the same general channels and is deposited around the house in various ways. If a careful examination were made by those people who claim to have difficulty from these two sources, undoubtedly it would be found that a very small portion of all the gas and dust comes through the register openings. As has been previously noted, the warm air furnace installation is far preferable to other types from the standpoint of relative humidity.

One probable cause of criticism on the part of owners of warm air plants may be due to the fact that the architect in his plans does not provide proper facilities for conducting the pipes from the furnace to the register openings. Where there is a large room to heat and the architect insists that the heating contractor carry his pipe within the limits of a 4-inch partition, he is immediately taking one of the steps most effectual in condemning the heating system to giving poor results. The round pipe is the most efficient conductor of air, the oblong pipe is next, while the very flat pipe is the least desirable on account of the extreme friction developed. If, then, the architect, in planning a house where an efficient warm air installation is desired, will, in consultation with the heating contractor, arrange the proper spaces for the pipes, thickening partitions or furring around the pipes, the chances are greatly in favor of the client being highly satisfied with his installation.

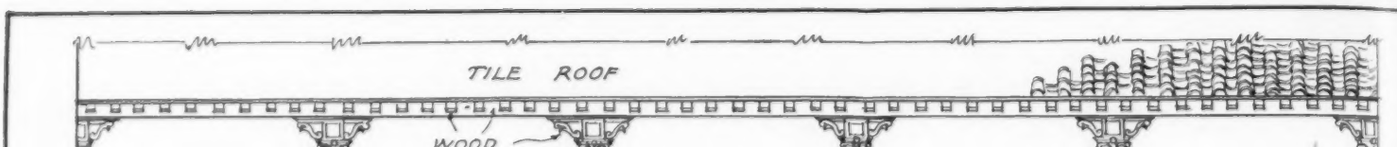
The cold air box or duct, which provides fresh air for the system, should preferably be located on the leeward side of the house and frequently will have a damper and opening to the inside air, causing a recirculating action for days when the outside temperature is extremely cold. A practical size for this duct is about ¾ the area of the combined heating ducts or, for an average of 480 square inches in pipe conducting warm air, a cold air duct of 16 x 24 inches would be ample for providing fresh air.

Obviously, the heating unit should be located near the center of the house so that the length of runs of the various pipes may be as nearly alike as possible (Fig. 1). Also, the pipes should come out of the top of the furnace instead of the sides. Each pipe should have the maximum possible pitch allowable by the height of the basement, and ¼ inch to a foot should be the minimum. Common practice in obtaining the size of pipe for a room is to divide the glass area plus ¼ of the exposed wall area in square feet by 1.2 for the first floor, 1.5 for the second floor, and 1.8 for the third floor the result to be read as square inches. For example, ¼ of 500 square feet wall area, plus 60 square feet of window glass in a typical living room, resolves itself into an area, the diameter of which is, approximately, 14 inches. This would be rather large to adapt for wall registers so that oval or oblong sections would have to be used.

The registers always should be installed with slate or concealed borders. The additional expense of this over the border in wood is negligible and it serves so much better to protect the register and to protect the floor that in the highest type of installation slate or metal is always used.

From the practical housekeeping standpoint, the registers should be located in the walls rather than in the floors, as in this position they do not offer themselves as receptacles for anything that one wishes to discard, and incidentally the natural dust cannot settle in the registers and then be thrown back into the room by the action of the warm air current.

If the more exposed rooms have the windows equipped with weather strips, or if the sash are properly fitted and if the spaces around the windows are properly made weather tight as the building is constructed, there will be no difficulty in heating any room under any air condition. It will be at once apparent to anyone analyzing this situation that the reason warm air furnaces will not heat an exposed room with the wind blowing into the room around the windows or through walls, is because of the pressure established by the leakage of the outer air which makes a plenum chamber momentarily of the room, and forces the cold air down the registers rather than permitting the warm air to come up.



ITALIAN RENAISSANCE DETAILS

A SERIES OF MEASURED DRAWINGS

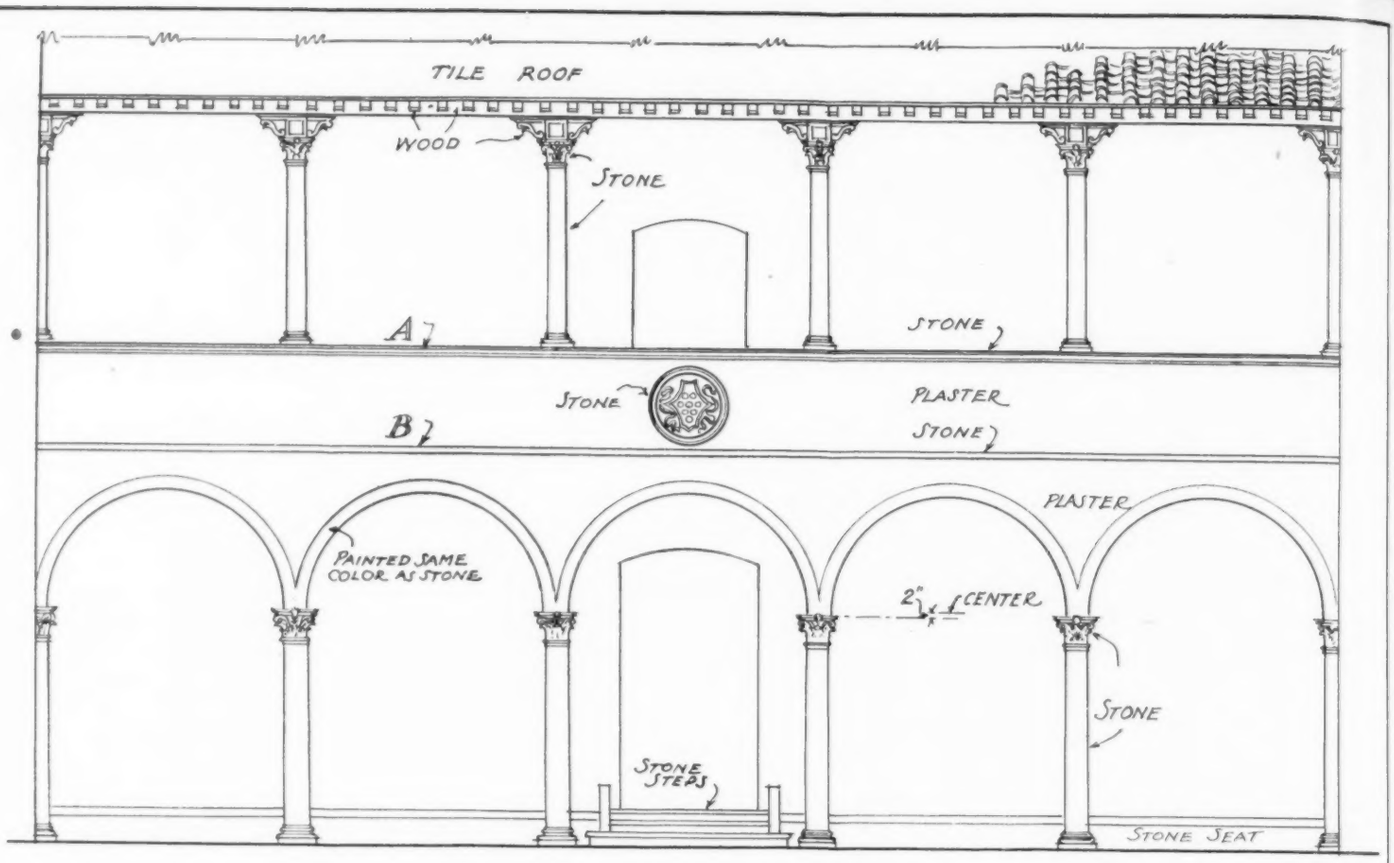
By F. NELSON BREED

LOGGIA OF THE "BADIA DI FIESOLE"

NEAR FLORENCE, ITALY

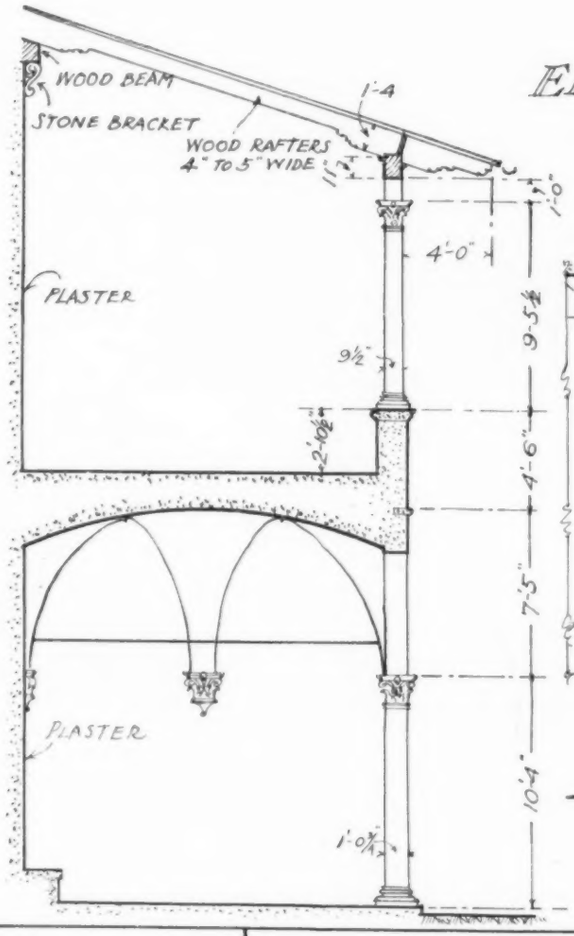
THIS graceful loggia of a 15th century abbey attributed to Brunelleschi, situated on the axis of a quaint old apple orchard, is constructed of masonry with an open timber roof. The parts indicated on the drawing are covered with a smooth stucco of a light creamy yellow. The columns, seats, corbels, string course and coping are of a dark yellowish gray limestone. The dark band which shows around the semicircles of the arches is simply painted on the stucco in color to match the stone. The floors are of red tile similar to our quarry tile. Above the caps of the upper columns the construction is of wood of a rich dark brown, the color of walnut. The consoles immediately above the columns are beautifully carved, each one being a little different in design. The roof tiles vary in color from salmon red to yellow ochre, surmounting a composition of considerable warmth.

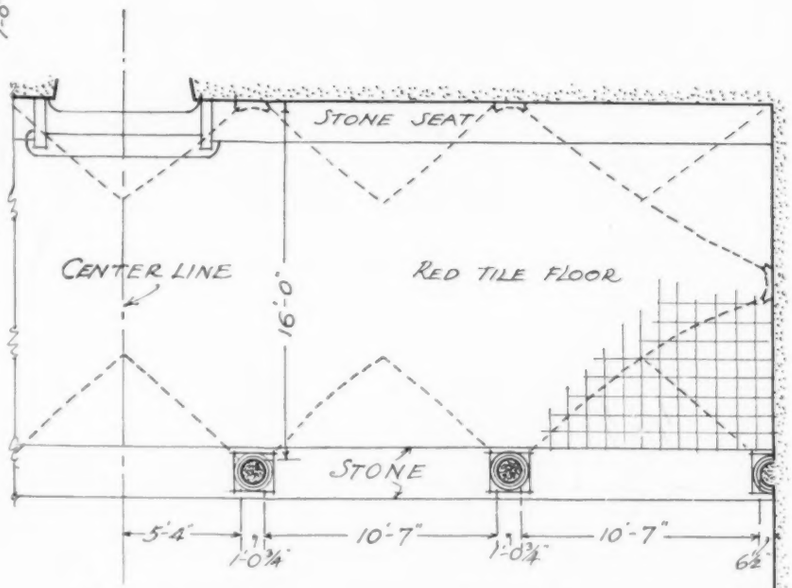
VARIES FROM 4" TO 5"



ELEVATION

NOTE
THE STONE IS DARK GRAY - THE PLASTER IS LIGHT CREAM COLOR



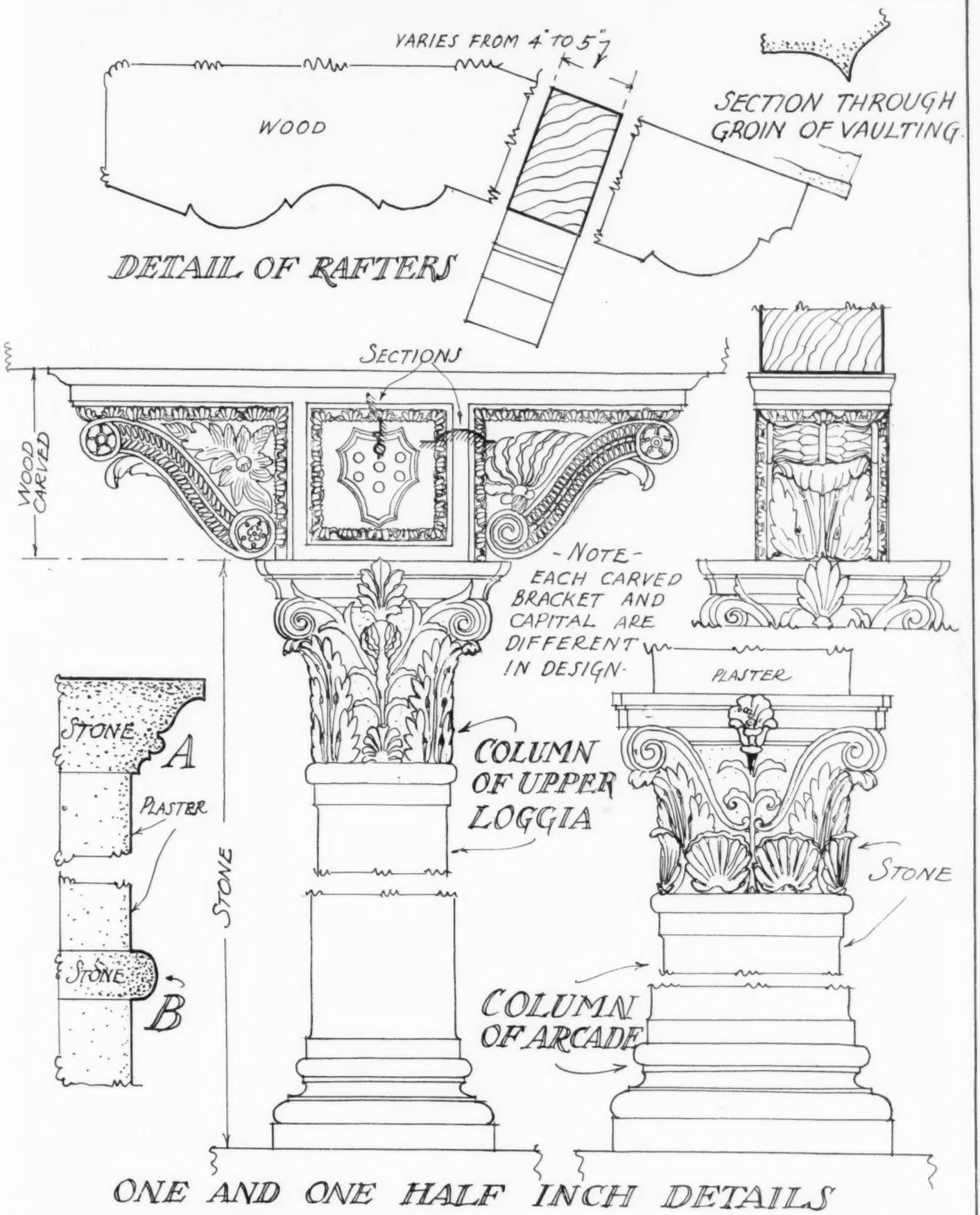


SECTION

½ PLAN

SCALE ⅛" = 1'-0"

MARCH 1922	LOGGIA BADIA DI FIESOLE NEAR FLORENCE, ITALY.	MEASURED AND DRAWN BY F. N. BREED.



MARCH 1922	LOGGIA BADIA DI FIESOLE NEAR FLORENCE, ITALY.	MEASURED AND DRAWN BY F. N. BREED

EDITORIAL COMMENT

THE KNICKERBOCKER THEATER FAILURE

WITHIN the past few months a number of building failures have been the subject of wide publicity in the daily press, with the natural attendant damage to the general reputations of architects, engineers and contractors. The collapse of the roof of the Knickerbocker Theater in Washington, entailing the loss of 98 lives, was a most unfortunate and regrettable calamity. Study of the cause of the collapse has been very thorough, by engineers and special investigators, but the reasons advanced are largely based on theory, the occasion being one of most unusual type in the history of building failures. The presence of a heavy load of snow on the roof was merely incidental and not to be considered the reason for the failure. From investigations now made it is safe to say that the roof would have failed at some time, irrespective of snow load; it seems an evil play of fate that the time of failure should have been during a performance.

Faulty and careless construction usually brings its own disastrous results while building is yet in progress, as in the instances of the recent theater collapse in Brooklyn and the failure of the Masonic Temple at Salina, Kansas. Such occurrences as these are readily explained and the blame can easily be placed. When a building fails after six years of apparently satisfactory service a far different and more complex problem for solution exists.

In theater construction particularly the demand for a number of years has been for large, unobstructed open spaces in the interior; columns have been eliminated because of sight demands, and complicated truss and cantilever construction has been evolved. The framework, furthermore, has not been designed as an entity apart from its enclosing shell; use is still made of masonry bearings and these supports are reduced to the minimum because of space and cost requirements. At best the average theater structure is dependent on the minimum of bracing, and the forces and actions of loads, both live and dead, must be carefully anticipated under such conditions.

The details of the Washington investigation so far available indicate that the roof fell in its entirety and was not preceded by any failure of its frame or supports. The main truss appears to have been unseated from its bearing and the roof slab and trusses, falling within the walls, crushed down part of the balcony. Two features of the failure stand out as carrying a lesson to architects. The first involves too great dependence on the checking function of the building department. The theater structure was originally designed by an engineer in collaboration with the architect. The contractor who carried out the work, in submitting his bid, tendered an alternative scheme for the steel work, prepared by steel fabricators and designed to reduce the cost of construction. This alternative type of framing was accepted with the provision that it meet the approval of the building department. It is not contended that this steel design was faulty or caused the collapse; it does, however, indicate the possibilities for dangerous construction when one agency, and that often taxed beyond the powers of its personnel and frequently headed by a political appointee, is placed in the position of sole judge.

The second point relates to an inadequate building code and the opportunity that exists for sacrificing structural strength for considerations of architectural design. The north wall of the theater was in the form of a gentle curve and this was also the facade on a residential street. It was 35 feet high from curb to bottom chord of roof trusses, and provided one of the supports for the main truss, carrying a load of 50 tons. Owing to the failure of the Washington building code in effect at the time of construction to make any distinction between exterior walls of general type, such as those for apartment houses, and a large open space building, the structural wall was permitted to be built 18 inches thick; this was slightly increased at points by an exterior pilaster treatment and a 4-inch facing of brick or stucco on tile according to location. The wall was furthermore pierced with a number of window openings on the exterior, to give the building a residential appearance to accord with the character of the neighborhood.

The theory for the failure that seems most likely is that a gradual outward movement of this wall took place which was eventually sufficient to unseat the main truss. There is no explanation for this movement, nor was there any advance evidence of it, such as cracking of the plaster decorations within the theater. The actual progress of the failure may never be known, yet it has already stirred the attention of architects, engineers and contractors throughout the country, and if it is the means of focusing attention on the construction of a uniform building code, based on scientific knowledge, the tremendous loss of life will not have been in vain. No code, however, can be devised that will dispense with competent professional advice, and in the last analysis engineers and architects must so govern their respective professions that the incompetent are eliminated and that the safety of the public depends upon qualified professional men.

DECORATION *and* FURNITURE

A DEPARTMENT
DEVOTED TO THE VARIED
PROFESSIONAL & DESIGN INTERESTS
WITH SPECIAL REFERENCE TO
AVAILABLE MATERIALS

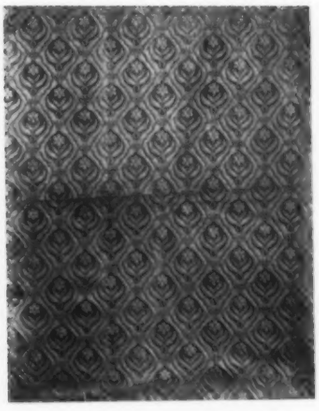
At Left a Georgian Chair with Damask Covering and Typical Shell Carving on Cabriole Legs

Courtesy, Nahon Co.

At Right a Georgian Chair with Needlework Upholstery, Cabriole Legs with French Scroll Foot

Courtesy, Orsenigo Co.

Mirror of Queen Anne Type, Bordered with Beveled Glass between Narrow Gold Mouldings. *Courtesy, W. & J. Sloane*



Silk and Linen Brocatelle, in Blue and Gold, Suitable for Chair Coverings. Portion Reproduced, 20 ins. wide

Silk and Mercerized Cotton Damask with Stripes Introduced in Design. Width, 25 ins.

A Simple Georgian Sofa with Straight Legs and Stretchers in Character of Chippendale's Early Chinese Designs Covering of Needlework

Courtesy, Hampton Shops

English Georgian Decorative Precedent

II. FURNISHINGS OF THE EARLY GEORGIAN DOMESTIC INTERIOR, 1720–1760

By STANWOOD MACOMBER

THE highly architectural yet simple background supplied by a Georgian interior offers an unsurpassed setting for furniture and decoration. Paneled walls, painted in a toned shade from a varied choice of colors, or else made of pine, purposely aged and waxed to bring out the deep orange tones of the wood, afford an excellent contrast for paintings—flower pieces, classic architectural subjects or portraits—generally in somewhat somber colors and set within simple architectural frames. Mirrors in rich frames of gold, or mahogany and gold, supply the high lights in wall accessories, those modeled after Chippendale's handling of rococo and Gothic motifs affording opportunity for the most gorgeous accents. Sometimes, as a variation from the usual paneling, walls of a Georgian room may be covered with damasks or other fabrics, choice being made of those of strong, definite pattern, and rich, sumptuous coloring, with a plaster cornice placed next to the ceiling.

An Excellent Modern Chair Showing Varied Influences in Georgian Design. Splat Carving Indicates French Rococo and Legs and Stretchers, Chinese Influence

Courtesy, Nahon Co.

For such an interior, which should have good ceiling height and be fairly large scaled, furniture must be selected which is ample in scale, colorful in its upholstery and rich in curved lines and carving. The furniture of the mid-eighteenth century, which has the necessary robust character to harmonize with Georgian architecture, was largely the result of the refinement and development of the earlier period of Queen Anne. Carving on the splats of chairs, the knees of chair legs and aprons of tables is a detail which largely characterizes Georgian pieces from their prototypes.

An important influence on furniture of this period was the work of William Kent, an architect of great popularity and manifold activities. The very large and imposing houses of the nobility, in which the

A Modern Sideboard of Walnut Veneer Exhibiting Simple Beauty of Queen Anne Furniture. Length, 6 ft., height, 34 ins., depth, 20 ins.

Courtesy, Kensington Mfg. Co.

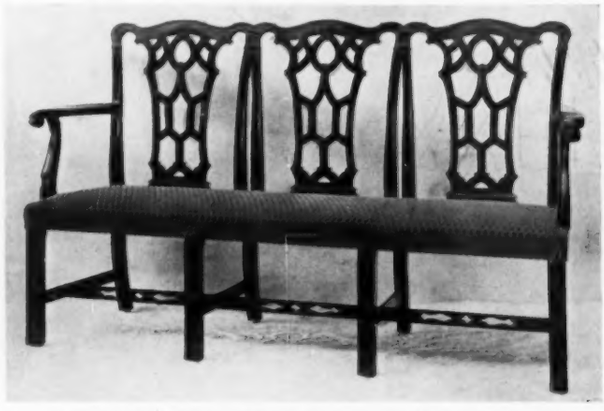
Corner of Library in Georgian Style Showing Typical Richly Carved Furniture of Period. Hampton Shops, Decorators

An Unusual Type of Wall Cabinet in Walnut Veneer, William and Mary Period
Courtesy, W. & J. Sloane

ceilings of the important rooms were often as high as 30 feet, as in the case of the double cube room at Wilton, required furniture of grand scale and great richness. Much of this furniture was designed by Kent; it took on classic forms with most elaborate carving and was frequently gilded. It has but slight application today, excepting occasionally where a rich accent may be desired, and then there is nothing to equal in effect one of the simpler carved and gilded stands of this type used to support an oriental lacquered cabinet of black or red and gold.

Wall pieces are available for different uses and in different sizes to fit conditions. They comprise cabinets with wood or glazed doors, high secretaries and bookcases. A wide variety exists in the periods of William and Mary, Queen Anne, Georgian and Chippendale, any of which can be used. Georgian chairs preceding those of the Chippendale era follow the Queen Anne type closely, with the omission of the stretcher, and greater elaboration of the back and arms. Upholstered chairs are also available, the

French Louis XV Armchair of Sufficient Size and Restraint to Harmonize with Georgian Pieces
Courtesy, Nahon Co.



A Three-back Settee of Particular Grace and Restraint in Chippendale's Chinese Style
Courtesy, Irving & Casson– A. H. Davenport Co.

William and Mary Walnut Bookcase or Cabinet with Marquetry Decoration
Courtesy, W. & J. Sloane

Corner of Painted Georgian Room with Good Grouping of Modern and Period Furniture. Hampton Shops, Decorators

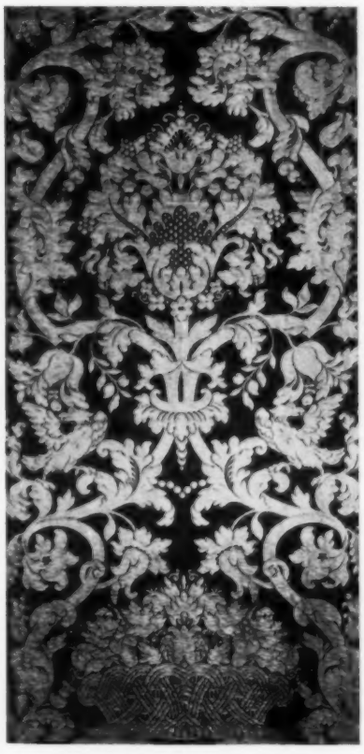
wing type belonging to the period and similarly the simpler form with open wood arms. Tables were of several distinct types, one of oblong shape supported by four cabriole legs and with a carved apron is frequently referred to as "Irish Chippendale"; an earlier type had a narrow framework supported by four plain cabriole legs, two of which were movable to support semi-circular drop leaves. The tripod table belongs also to this period, and was later greatly enriched with carving and fret galleries by Chippendale whose vogue began during this period.

The richness and color which are so typical of the Georgian room are acquired largely through the use of fabrics for upholstery and hangings. In the original rooms materials imported from Italy and France were at first used, and later many fine fabrics were woven in England. Modern weaves comprise damasks, cut velvets, brocatelles, mohair velours and block printed linens. True Georgian patterns and colorings are readily available, and combinations of all silk, silk and cotton, or silk and linen may

An Early Georgian Sofa with Richly Carved Cabriole Legs and Needlework Upholstery
Courtesy, Hampton Shops

An Excellently Proportioned Wing Chair of Queen Anne Period Upholstered in Block Printed Linen
Courtesy, Irving & Casson — A. H. Davenport Co.

Black and Buff Damask with Large Scale Georgian Figure. Width of Pattern, 25 ins.



Old Crimson Silk and Linen Damask with Tinsel Effect Background. Width of Pattern, 25 ins.

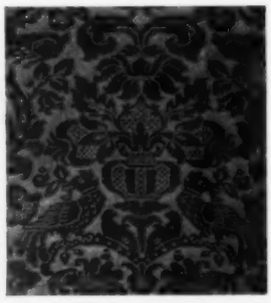
Block Printed Linen in William and Mary Pattern. Width of Pattern Shown, 25 ins.

be selected according to requirements of wear and appropriateness. In some instances modern fabrics are better than the old, as, for example, gaining the effect of tinsel thread without its defect of tarnishing by winding silk about a linen thread. The damasks for hangings and upholstery are largely in bold figures and in two-toned combinations in old crimson, old gold, green and plum. Needlework was contributed from Holland, and this is available today in handwork or machine weaving. Originally used on furniture of the restoration period, it covers equally well a sofa of the slender, square legged type of Chippendale's early Chinese efforts.

Another material of great interest is crewel embroidery of large, naturalistic pattern of birds and flowers on natural colored linen; this likewise is available in modern weaves, either the product of hand or machine.

Windows in the Georgian houses are usually single and designed to emphasize the vertical dimensions. The hangings are frequently of damask or velvet, arranged in formal fashion and extending to the floor. They may be hung from cornices, painted the color of the walls or gilded, and below there is usually a shaped valance or one arranged in graceful folds; the curtains are looped back with heavy cords and tassels at a distance

Georgian Style Damask Hangings, Red Cross Building, Washington, D. C. Francis H. Bacon Co., Decorators



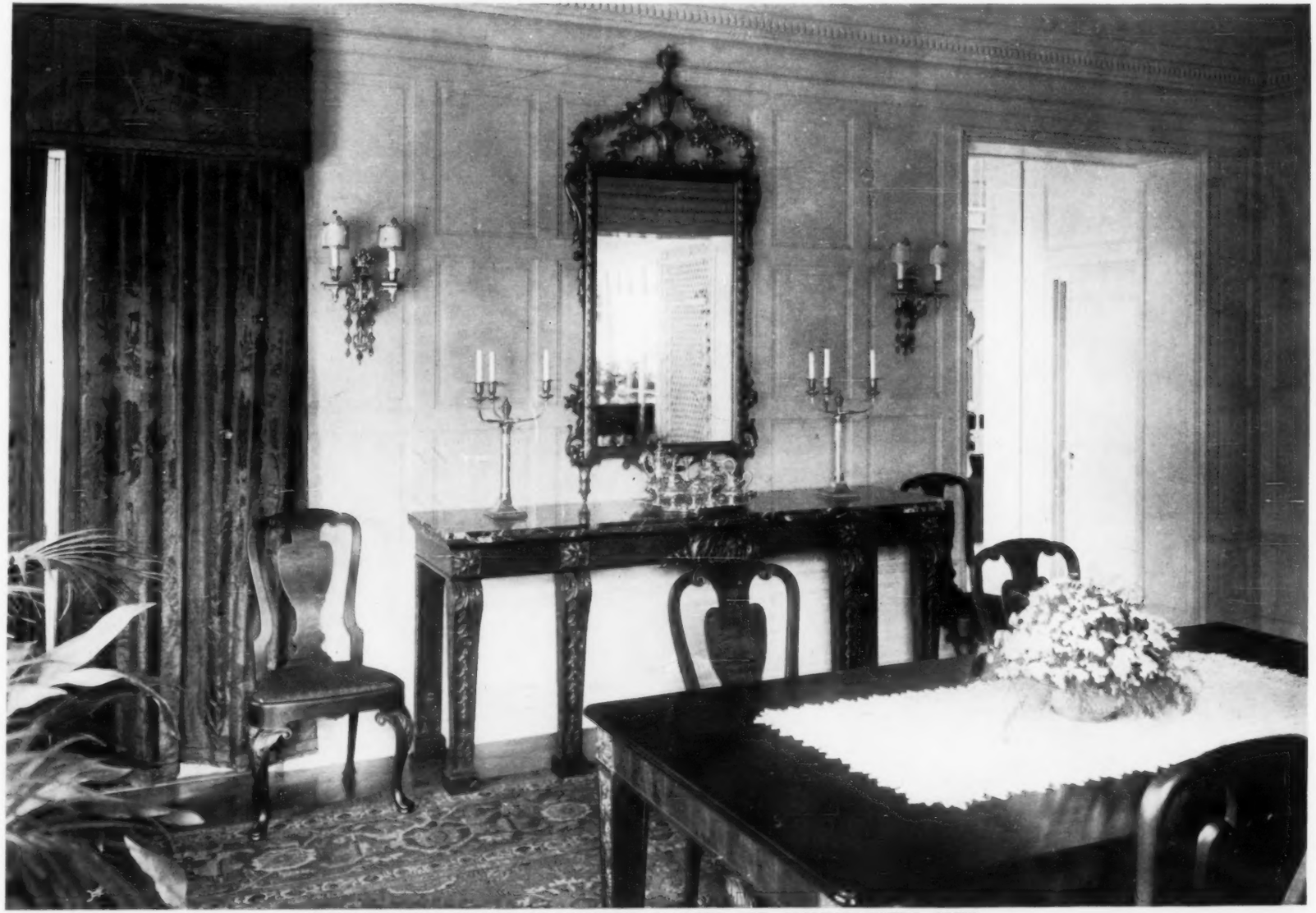
Silk and Cotton Damask in Blue and Gray. Width of Pattern, 18 ins.

Georgian Damask Hangings and Damask Wall Covering in House at Toledo, O. Henry F. Bultitude, Decorator

LIBRARY IN HOUSE OF HENRY P. DAVISON, ESQ., NEW YORK

WALKER & GILLETTE, ARCHITECTS LENYGON & MORANT, DECORATORS

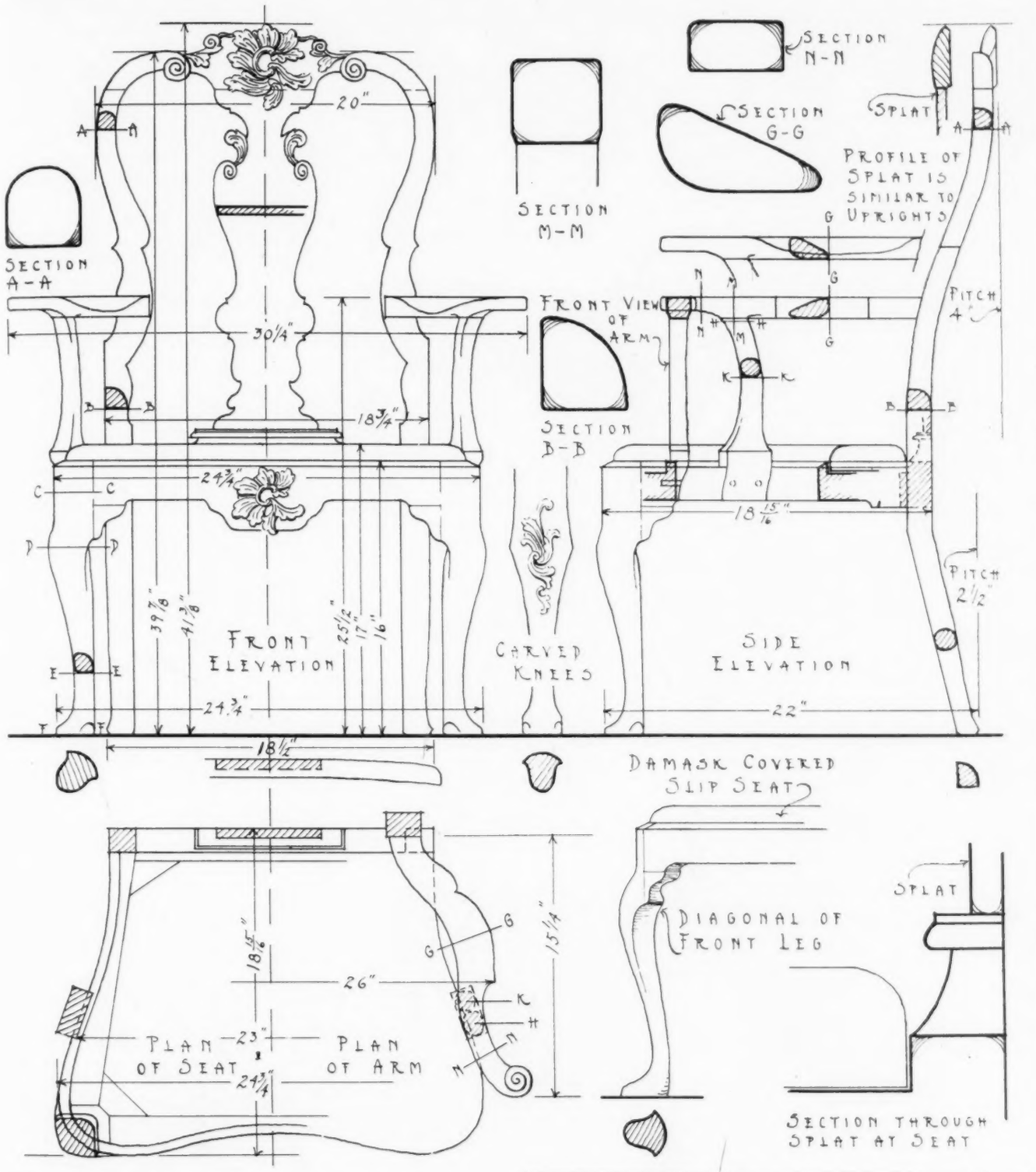
Typical Georgian chimney-piece treatment with two-toned marble mantel. Wall panels, ceiling and cornice of William and Mary detail. Furnishings in English eighteenth century and modern over-stuffed pieces



DINING ROOM, HOUSE OF RICHARD GARLICK, ESQ., YOUNGSTOWN, OHIO

CHARLES A. PLATT, ARCHITECT

Excellent ensemble of Georgian furnishings. Modern adaptation of earlier English paneling with Georgian detail. Side table shows simplified classic form after Kent. Hangings of brocade with chinoiserie motifs



GEORGIAN ARMCHAIR

FROM

THE MUSEUM OF FINE ARTS

BOSTON MASSACHUSETTS

ENGLISH WALNUT

1725

ELEVATIONS - SCALE 1½" = 1'-0" SECTIONS ½ F.S.D.

MEASURED AND DRAWN BY RACHEL C. RAYMOND

either one or two-thirds of the window's height. Round headed windows are occasionally used, and if their heads are close to the ceiling a simple arrangement of hangings that will permit the curved architrave to show is satisfactory.

Floors in formal rooms such as halls and dining rooms were often of marble laid in tile shapes and in contrasting colors; oak in wide boards or simple parquetry patterns serves well for living rooms and libraries. Oriental rugs are appropriate floor coverings; so also are the plain, heavy chenille carpets. These latter can be obtained in shapes and sizes to fit any condition, and they are frequently made with ornamental borders displaying classic motifs. These rooms demand a dignity not supplied by small rugs.

Georgian Armchair from Museum of Fine Arts, Boston.
Measured Drawing on Preceding Page

Lighting fixtures of the time were of course fitted for burning candles, and the chandelier and wall sconce were widely used. The original forms are quite as well adapted to electricity, and there is a wide choice in design, scale and material among modern work suitable for the period. Wall sconces were frequently of silver with back plates, sometimes with mirror insets; ceiling fixtures took their forms largely from the Dutch chandelier having a central ball with curved radiating arms. Crystal forms, both in chandelier and wall brackets, belong to the period, and those most typical show the same tendencies in design as the metal and gilded wood fixtures.

One of the most admirable qualities of the Georgian style is its flexibility, coupled with the ease with which it may be adapted to different uses. It can as readily be employed for a dignified, quiet library as for a gay, colorful morning room. For modern rooms it should never be given a rigid formality; the furnishings should never be restricted to one limiting school or motif. It would be the height of dullness to see every chair, table and cabinet supported by cabriole legs. To be interesting and livable a room must show contrasts; a heavy, architecturally designed piece of furniture must be offset somewhere by a light, graceful piece.

The period has many possibilities for American country and city houses in which space is not held at too great a premium. It combines a considerable degree of formality and dignity with great luxury and ease of living; in its simpler forms, such as may be found in the university towns of England, it is frankly domestic and possessed of a strong character which gives it a certain satisfactory wearing quality.

Upholstered Georgian Side Chair with Needlework Tapestry Covering
Courtesy, Kensington Mfg. Co.

Lacquered Cabinet on Stand of Simple Georgian Design
Courtesy, Kensington Mfg. Co.

Georgian Side Chair with Heavy Frame and Elaborate Carving
Courtesy, Orsenigo Co.